Wenner-Gren Foundation for Anthropological Research

Staple Finance, Wealth Finance, and Storage in the Inka Political Economy [and Comments and Reply]
Author(s): Terence N. D'Altroy, Timothy K. Earle, David L. Browman, Darrell La Lone, Michael E. Moseley, John V. Murra, Thomas P. Myers, Frank Salomon, Katharina J. Schreiber, John R. Topic
Source: *Current Anthropology*, Vol. 26, No. 2 (Apr., 1985), pp. 187-206
Published by: The University of Chicago Press on behalf of Wenner-Gren Foundation for Anthropological Research
Stable URL: http://www.jstor.org/stable/2743135
Accessed: 25/08/2010 06:35

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at http://www.jstor.org/page/info/about/policies/terms.jsp. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/action/showPublisher?publisherCode=ucpress.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

The University of Chicago Press and *Wenner-Gren Foundation for Anthropological Research* are collaborating with JSTOR to digitize, preserve and extend access to *Current Anthropology*.

http://www.jstor.org

CURRENT ANTHROPOLOGY Vol. 26, No. 2, April 1985
© 1985 by The Wenner-Gren Foundation for Anthropological Research, all rights reserved 0011-3204/85/2602-0005$2 50

Staple Finance, Wealth Finance, and Storage in the Inka Political Economy[1]

by Terence N. D'Altroy and Timothy K. Earle

THE EVOLUTION OF COMPLEX SOCIETY is a central issue in recent anthropological thought. Analysts of cultural evolution have adopted various perspectives to understand the relationship between developing political complexity and economic organization. Particularly influential have been the functionalist arguments that seek to explain the development of new institutions, such as centralized leadership and regional political organization, as means to solve problems of production, security, and privileged access to economic resources. Such theories emphasize the way new forms of integration manage problems created by increasing population density and the concomitant intensification of subsistence activities or the way privileged access to necessary resources is maintained in the face of competing claims (see Service 1975). Arguments centered on the requirements of information processing (e.g., Wright and Johnson 1975, Wright 1977) and the social relations of production (e.g., Godelier 1977, Friedman and Rowlands 1977) have also stimulated considerable interest in the recent literature.

An alternative approach focuses on the relationship between the evolution of social complexity and increasing energy capture. This perspective, which underlies the present discussion, is based to a certain extent on principles of cultural evolution worked out by prior researchers. For example, Childe (1951), drawing from 19th-century Marxian ideas, argued that the evolution of complex society required technological progress and the production of a food surplus. The surplus was seen as necessary to support social elites, government bureaucrats, craft specialists, and the other non-food-producers that characterize complex societies. In a sweeping general formulation, White (1959) proposed that cultural evolution was based on progressive levels of energy capture and related cultural elaborations. As Steward (1960) noted, however, the problem is not simply how much energy is available but how that energy is used. In simple terms, an increase in the amount of energy brought into a cultural system can result in either more biomass (more people) or more complex systems. Analyses of the development of social complexity must therefore be concerned with how energy is channeled to finance the creation and maintenance of new social institutions and the elaboration of old institutions (cf. Adams 1978; Price 1978, 1982; Harris 1979).

Included among these institutions are regionally integrated government, religion, and social elites (Fried 1967, Service 1975). The development of these complex features is predicated on the growth of existing systems of finance to channel needed resources from local production. Of comparable importance is the establishment of new socioeconomic institutions to develop alternative sources of revenue, such as centralized taxation, tribute, and administered exchange. Sources of finance are thus essential to the evolution of the sociopolitical and religious institutions which provide the authority and power components of the state.

In this paper, we are primarily concerned with (1) the reorganization of the economic systems of the state and its subject polities to meet the requirements of the expanding state and (2) the development of new forms of finance, drawing on both staple and wealth products, to meet state needs. Assuming that

[1] We would like to thank Morton Fried, Ross Hassig, John Hyslop, William Macdonald, Alison Paulsen, and Barbara Price for reviewing various drafts of this paper. While we have incorporated a number of their comments into the text, we, of course, remain responsible for the interpretation and any errors of fact.

TERENCE N. D'ALTROY is Assistant Professor of Anthropology at Columbia University (New York, N.Y. 10027, U.S.A.). Born in 1950, he was educated at the University of Michigan (B.A., 1972) and at the University of California, Los Angeles (M.A., 1975; Ph.D., 1981). He has been Co-Director of the Upper Mantaro (Peru) Archaeological Research Project since 1977. His research interests are the organization and evolution of complex prehistoric political and economic systems, New World archaeology, and analytic methods in archaeological research. He has published, with Timothy K. Earle, Catherine J. LeBlanc, Christine A. Hastorf, and Terry Y. LeVine, "Changing Settlement Patterns in the Upper Mantaro Valley, Peru" (*Journal of New World Archaeology* 4:1–49); with Timothy K. Earle, "Storage Facilities and State Finance in the Upper Mantaro Valley, Peru," in *Contexts for Prehistoric Exchange,* edited by Jonathan E. Ericson and Timothy K. Earle; and, with Christine Hastorf, "The Distribution and Contexts of Inca Storage Facilities in the Xauxa Region of Peru" (*American Antiquity* 49:334–49).

TIMOTHY K. EARLE is Associate Professor of Anthropology at the University of California, Los Angeles. He was born in 1946 and received his B.A. from Harvard College in 1969 and his M.A. (1971) and Ph.D. (1973) from the University of Michigan. He did archaeological research for the Bishop Museum in 1971–72 and has taught at UCLA since 1973. His research interests are prehistoric economics, cultural ecology, social evolution, the Andes, and Polynesia. His publications include, with coeditor J. Ericson, *Exchange Systems in Prehistory* and *Contexts for Prehistoric Exchange* (New York: Academic Press, 1977 and 1982); with A. Christenson, *Modeling Change in Prehistoric Subsistence Economies* (New York: Academic Press, 1980); and *Economic and Social Organization of a Complex Chiefdom* (University of Michigan Museum of Anthropology, Anthropological Papers 63).

The present paper was submitted in final form 25 VI 84.

the state's economic goal is to expand its labor and natural resources, we argue that the key factors affecting the finance organization are the capacity of the subject groups for gross surplus production, a required state investment in political and economic security, and the potential efficiency of production, logistical, and disbursement mechanisms. We focus our discussion here on Inka state finance, although the arguments are not necessarily restricted to this case.

STAPLE FINANCE AND WEALTH FINANCE

For the purposes of the present discussion, we may dichotomize systems of finance in archaic states into two general types, *staple finance* and *wealth finance,* on the basis of the form in which the material support is mobilized. *Staple finance* (Polanyi 1968:321; Earle and D'Altroy 1982:266) generally involves obligatory payments in kind to the state of subsistence goods such as grains, livestock, and clothing. The staples form accounting units (a bushel of wheat or a head of sheep) that have established values. Staples are collected by the state as a share of commoner produce, as a specified levy, or as produce from land worked with corvée labor. This revenue in staples is then used to pay personnel attached to the state and others working for the state on a part-time basis. The obvious advantages of such a finance system are its simplicity and directness in collecting generally available products needed by the households that are involved in state activities rather than solely in subsistence production. The main disadvantage is the cost of bulk storage and transportation. Such goods are typically heavy in relation to their value, and it is inefficient to move them over long distances. For this reason, staple finance is most appropriate for relatively small agrarian states and for empires with highly dispersed activities that can be supported by regional mobilizations. Staple finance includes systems that have been called redistribution (Polanyi 1957, Dalton 1961, Murra 1980 [1956]), mobilization (Smelser 1959, Earle 1977), and tax in kind.

Wealth finance involves the manufacture and procurement of special products (valuables, primitive money, and currency [cf. Dalton 1977]) that are used as a means of payment. These wealth items often have established values with respect to other goods of a similar nature but vary in their convertibility into staples (Bohannan 1955, Earle 1982). They may be amassed as direct payment from subservient populations, or they may be produced by craft specialists attached to the central authorities. In the latter case, raw materials given as tribute are often used in the manufacture of these goods, and the craftsmen may be provided as part of a labor obligation from local communities. Wealth held by the state is used to pay political officials and other personnel who work for the state. The obvious advantages of such financial units are their storability and transportability, which allow a more centralized control over finance than is possible with bulky staples. Wealth is also appropriate for territorially extensive states, such as the Aztec, in which the goods used in finance are moved over long distances. The main disadvantage of wealth items is that they often have restricted intrinsic use value and so must be converted into subsistence or utilitarian goods used to support the nonagricultural personnel. As Brumfiel (1976, 1980) argues for the Aztec case, conversion on a large scale requires a market system in which the tribute goods used as state payment are sold for subsistence goods.

The division between staple and wealth finance is of course largely heuristic, and the financial base of complex societies typically involves a mixture. For example, in an agrarian society such as the complex Hawaiian chiefdoms, staples mobilized from community production are used to support craft specialists who are attached to the chiefs and who manufacture wealth items (Earle 1978:184–85). In this way, staples are converted into wealth directly. Alternatively, special goods may be manufactured for trade with outside groups that manufacture valuables or control valuable resources. On the other side, materials received as tribute may not be "wealth," strictly speaking, but may be a highly desired utilitarian material not locally available. The materials can then be exchanged in markets for subsistence goods from local farmers, as in the Aztec case. As we will describe for Inka state finance, staple finance is often used to support local administrative activities, and wealth finance is used to support more centralized state functions requiring long-distance movement of goods.

THE INKA POLITICAL ECONOMY: THE PROBLEM

The institutional organization of the Inka state economy has been extensively studied, primarily through reference to ethnohistoric sources (e.g., Baudin 1928; Rowe 1946; Moore 1958; Morris 1967, 1974; Métraux 1969; Murra 1975, 1980 [1956]; Godelier 1977; Wachtel 1977). Early researchers' perception of the state economy as a monolithic structure has been discarded since the recognition of significant variation among imperial provinces in economic and political organization. Nonetheless, general organizational features and policies are discernible, and it is these with which we are more concerned here.

The empire of Tawantinsuyu, encompassing approximately 984,000 km^2, was divided into four administrative quarters centered at Cuzco. The empire comprised about 80 provinces, roughly corresponding to the territories of subject populations (Rowe 1946:262; Schaedel 1978:292). Provinces were subdivided into two or three political units called *saya,* each subsuming a variable number of *ayllu.* The nature of the *ayllu* is widely debated, but it is generally considered to be an endogamous kin group with a communal territory; it formed the basic corporate productive group above the household (Rowe 1946:254; cf. Moore 1958:22; Zuidema 1964:26–27; Murra 1980 [1956]:191).

Governance was vertically oriented, as political control was vested hierarchically in offices filled by ethnic and honorary Inkas and elites from subject groups. Horizontal compartmentalization was key to Inka administration, because it discouraged interethnic alliances against the state (Schaedel 1978). Political integration was accomplished through use of both existing kinship systems and hierarchically ordered, nested numerical divisions (e.g., the decimal system of administration). The state seems to have made an effort in some instances to make state and local hierarchies congruent with one another, apparently to facilitate use of the local elites as middle-level management (Murra 1958, D'Altroy 1981). In a complementary policy, a substantial proportion of the subject populations was resettled, apparently to reduce threats of insurrection and to meet economic needs in other parts of the empire (Rowe 1946:269–70; Espinoza 1975).

As is shown most clearly in the work of Murra (e.g., 1975, 1980 [1956]), economic support for the state came primarily from use of the productive capacities of the local populations. Much of the state's economic output was produced through a corvée labor tax, assessed to each household on a rotating basis. Craft specialist enclaves were also established, and some levies were directly laid on goods produced or traded. The state's intent seems to have been to phrase economic relations with the local populace in terms of the relations the local elites had maintained with the commoners prior to the Inka conquests (Wachtel 1977:62; Murra 1980 [1956]:90).

The literature on the Inka political economy has tended to focus on institutional organization, relations of production, land tenure systems, and the social relations of exchange between the state and its subordinate populations (e.g., Espinoza 1978). Conversely, the importance of control of goods and their role in underwriting the state political economy is usually mini-

mized either implicitly or explicitly. It is generally argued, for instance, that state activities were funded amost solely through application of a labor tax (e.g., Rowe 1946:265; Lumbreras 1974:229–30; Godelier 1977:64; Murra 1980 [1956]:92). Tribute in goods is said not to have existed (Murra 1982:288; compare Salomon 1978*a* for an alternative view) or to have been phrased in such a way that only labor, not goods, was extracted from the local populations (Murra 1975:243–54; cf. Murra 1982). Sumptuary goods are typically assigned the role of (asymmetrical) reciprocal gifts between elites, and it is often argued that they were limited in circulation and therefore played a minor role in the state economy (e.g., Wachtel 1977:70).

While these analyses have been illuminating, we remain uninformed about key aspects of state finance. In particular, knowing the form of the institutional framework does not inform us directly about choice of policy or allocation of resources within or among institutions. The focus of this paper is therefore primarily the production, management, and disbursement of goods and only secondarily the state's control of labor.

The central point we wish to make is that the energetic requirements of production and management of goods were at least equal in importance to the social relations of labor and exchange in the organization of the state economy. Analysis of the state's use of a mixture of subsistence and utilitarian goods and valuables and semimonetary goods to fund its activities provides a perspective to explain the development of the state economy alternative to that which currently dominates the literature. Production of staples was primarily for use in local or provincial material sustenance, while the developing wealth finance system provided a means of underwriting management and of integrating local elites into the state economy interregionally. The use of a mixture of these goods afforded the Inkas a measure of flexibility in allocating resources among the various local and interprovincial requirements of the political economy. We argue that, in both staple and wealth sectors, the state took costs of production and management into account in its organization and altered both institutions of production and exchange relationships to meet its material needs.

The study of the institutional relations of labor organization and elite-elite exchange is, of course, critical to understanding the Inka economy. Similarly, we agree that the labor tax was the principal source of surplus production for the state. It should be equally apparent, however, that the mobilization and allocation of that labor were to a large degree contingent on the intended uses of the labor's products. Additionally, because control of access to both staples and valuable/monetary goods lay at the core of the state's ability to fund its activities, the balance in the use of the two general classes of goods merits careful consideration.

INKA STAPLE FINANCE

For the purposes of the present review, we may characterize Andean economies under the Inkas as comprising two related but distinct organizations: the local subsistence economy and the state political economy. Because the staple finance aspect of the political economy was initially constructed on a base analogous to the local subsistence economies, we will review their central features here briefly (see Murra 1975, 1980 [1956] for a more thorough review).

The *subsistence economies* of Andean highland communities were generalized to incorporate a wide range of economic resources. The vertically compact Andean landscape made a vast array of products accessible to highland communities within short distances of their principal residences. The apparent ideal was to integrate the distinctive economic zones within a single community through autonomous production and reciprocal exchange, an organization that circumvented the need for extensive market exchange. Communities in the Mantaro Valley of the central Peruvian highlands, for instance, had ready access to flat valley bottomlands (3,150–3,400 m) suited to intensive maize agriculture, the adjacent rolling uplands and hillslopes (3,400–3,800 m) conducive to extensive tuber and quinoa cultivation, and the surrounding *puna* grasslands (3,800–4,800 m) suited to camelid herding. Products such as coca, capsicum pepper, and fruit could be procured either directly or through exchange from the nearby *montaña* and *selva* on the eastern side of the Andean *cordillera* (Earle et al. 1980:6–8). Under certain circumstances, control over land was extended by colonization to more distant, economically significant zones to obtain goods such as coca, pepper, and marine products (Murra 1972). This organization did not obviate barter exchange of goods or exchange of use rights to resources among communities or ethnic groups, however (Ortiz de Zúñiga 1967–72 [1562], vol. 1:31, 63, 73, 179, 219, 329; see Burchard 1974).

This mainstream central Andean highland pattern may be contrasted with those of the north and central coasts of Peru and the highlands of Ecuador, where economic specialization in production and exchange was more highly developed. On the north coast of Peru, for instance, entire corporate groups functioned as economic specialists (e.g., in fishing), with the intention of exchanging the products for other goods of specialized production (e.g., sandals, salt, pottery, agricultural products) (Netherly 1978:209; Rostworowski 1977). Trading specialists have also been noted for Ecuador and the Peruvian coast, trafficking in shell beads (*chaquira*), gold, copper, salt, coca, and a variety of other commodities, apparently in systems of administered exchange or incipient market exchange (see Rostworowski 1970, 1981; Salomon 1978*a*, 1983). These sources clearly show that, among the societies conquered by the Inkas, subsistence economies varied considerably in strategy and complexity. This diversity seems to have directly affected the way the Inkas economically integrated conquered regions.

These local economies may be contrasted as a group with the *state political economy,* that is, the system that mobilized and allocated the goods and services that funded state activities. As noted above, it is generally argued that the principal source of state support was a corvée labor tax and that local communities made no material contributions from their own goods or produce. This assertion is supported by statements in major chronicles and in some local inspections (e.g., Polo 1940 [1561]:165, 169; Cobo 1956 [1653], vol. 2:119; Diez de San Miguel 1964 [1562]:80; Ortiz de Zúñiga 1967–72 [1562], vol. 1:24; see Murra 1980 [1956]:95).[2] The labor tax was assessed to the local populace on a rotating basis, phrased in terms of reciprocal economic relationships between the households of the *ayllu* and the state (Wachtel 1977:66). As has been noted by numerous authors, the state was thus extending a relationship of obligations that had already obtained between the local elites and their populace. The state established this relationship by arrogating to itself the rights to all productive resources in the empire, including agricultural and grazing land, undomesticated biota, and raw materials for craft production.

[2] Exceptions to this may be found in early inspections (e.g., Ortiz de Zúñiga 1967–72 [1562], vol. 1:47; Martínez Rengifo [1571] in Espinoza 1963:63; see Salomon 1978*a*, 1983), primarily in the form of direct prestations of finished craft goods and gathered materials. Murra (1975:242–54; see also 1982) has argued that, because the raw materials from which these were made or collected were owned by the state, the local populations were only giving their labor. We do not find this explanation satisfactory for all cases but prefer not to explore the issue in detail here because of its complexity.

Local communities therefore held their land only in usufruct, for which right they were obliged to render labor service to the state. In return, the state materially supported people who were performing their tours of duty, provided security through military protection and fall-back storage, and performed religious ceremony (Polo 1916 [1567]:20).

Mit'a (labor service) included collective labor on the lands of the state and of the state religion and personal periodic service for specific activities (Cobo 1956 [1653], vol. 2:121; Wachtel 1977:71; Murra 1982). Most subsistence goods were produced on state lands either alienated from the local communities or created through agricultural intensification such as terracing, irrigation, or expansion of fields (e.g., Chincha [Castro and Ortega Morejón 1936 (1558):244]; see also Murra 1980 [1956]:31, 94). The state also developed and amplified specialized labor institutions. The *mitmaqkuna* were displaced colonists (either individuals or entire communities) who served as specialized farmers, military police, and artisans (for discussion, see Espinoza 1975). The responsibilities of the *aqllakuna* (chosen women) included textile manufacturing and *chicha* (maize beer) production (Morris 1974). The *yanakuna* (specialist servants) performed such varied tasks as palace and temple service, tilling of the Inka's private lands, herding, and administration (Cieza de León 1967 [1553]:69; see also Wachtel 1977:73–74).

The products of the labor of the communities and the craft specialists were collected and stored by the state in immense warehouse complexes (e.g., Cieza de León 1862 [1551]:397; Vega 1965 [1582]:169). In general, the staples were stored locally to support permanent provincial personnel throughout the year and to fund periodic labor projects (Morris 1967). Many of the craft products (such as ceramics and rough cloth) were probably consumed locally, but many of the finer wealth goods were shipped to Cuzco as tribute, phrased as gifts (e.g., Ortiz de Zúñiga 1967–72 [1562], vol. 1:26).

The recognition that a labor tax on local communities and the establishment of labor specialists were the principal means of state finance should not, however, obscure two key features of the Inka political economy. First, a distinction exists between what the local communities saw themselves as paying to the state and what the state was actually receiving. While the state ideology may have maintained that the populace was rendering only labor and the local populations may have often reported paying taxes as such, the state was receiving both goods and services (Moore 1958:49). The sources cited above also suggest that the labor input varied to meet the required material output in the production of several classes of goods. For instance, the quantity of land to be cultivated (or the amount of seed to be sown) and the amount of wool to be woven into cloth by the local communities were determined annually (e.g., Diez de San Miguel 1964 [1567]:31, 39, 92). The state was thus apparently estimating its material needs and requiring the local communities to contribute whatever labor was necessary to meet those needs, taking into account their productive capacities as determined from the census counts.

Second, the state's economic relations with the populace were distinct from those with the local elites. Manipulation of these relations led to the incipient development of a partially independent state staple finance sector, on the one hand, and a state-elite sphere of exchange based on wealth goods, on the other. The latter process suggests a shift away from a state finance system based solely on local labor to one incorporating increasingly "monetized" state-local relationships. The state directly obtained wealth and monetary objects from local elites, often phrasing the exactions as reciprocal gifts. Direct mobilizations of manufactured and gathered products from local elites are recorded, for example, for the Quito area (Salomon 1978*a*, 1983), for Chucuito (Diez de San Miguel 1964 [1567]:39), and for the Guancayo polity of the upper Chillón Valley of the central Peruvian coast (Martínez Rengifo [1571] in Espinoza 1963:63). We return to this issue in greater detail below.

While this review provides us with an understanding of the basic institutional organization of the state economy, we remain uninformed about the relationships among the different sectors. One key to the problem lies in the way we view what are generally termed the redistributional features of the staple finance system. As applied to the Inkas, redistribution is often seen as a means of commodity exchange and of integrating subject populations into the centralized economic system (e.g., Wachtel 1977:62; Murra 1980 [1956]:121–34). We suggest that *mobilization* more accurately describes the system of finance used to obtain goods from both the subsistence producers and the local elites than does the more general term *redistribution* (Smelser 1959; Earle 1977:215; Earle and D'Altroy 1982:266). Redistribution in complex societies combines aspects of centrally administered exchange (Service 1975:75–78) and economic integration (Polanyi 1957:253–54) with extraction of the goods needed to fund centrally controlled activities. As societies become more complex and a larger fraction of the collected goods is allocated to support a managerial sector, what appears structurally to be redistribution takes on the role of centralized finance (i.e., becomes mobilization) while maintaining the trappings of political and ritual integration. The key to this transition lies in the central authority's increasing capacity to enforce an extractive economic relationship with the subordinate populations, while reinvesting a smaller proportion of the goods collected in supporting unattached producers or political relations with the subordinate populations.

In most current analyses of the Inka political economy, the costs and economic constraints of such mass mobilization of goods are often overlooked. Therefore, to exemplify the relationship between the energetic requirements of centrally controlled goods production and management, on the one hand, and the organization of state labor, on the other, we will examine the role of centralized storage in the mobilization of goods to fund intraprovincial activities. To provide the theoretical rationale for this argument, we will also briefly review the developing role of storage in an expanding state economy.

STAPLE FINANCE AND STORAGE IN THE STATE POLITICAL ECONOMY

Storage is a mechanism to average fluctuations in the availability of a material over time. It is employed to synchronize variable production and use of goods, a function that is critical in both subsistence and political economies. A second function is to average annual variation in food production that unpredictably affects total yearly harvest of food. To hedge against crop failures with environmental causes such as random variability in climatic and disease conditions or social causes such as warfare, crops harvested in good years may be carried over from year to year.

In the subsistence economy of a local community, the most important use of storage is to average out the variable seasonal supply of food to meet the nearly constant daily household demand for it (fig. 1*a*). In agricultural societies, the availability of foods typically varies with the seasonal cycles of cultivation, harvest, and consumption. Food harvested during a relatively brief period of abundance is stored through the year to feed the family and community. For example, among the Gwembe Tonga of modern Zimbabwe, bulrush millet harvested by a woman in February is held for use by her and her family through one yearly cycle (Scudder 1962:26–27). Such household control of and access to stored foodstuffs provide economic independence and security, with the result that the close association of living and storage areas characterizes many domestic units. The use of household storage appears in numerous prehistoric Andean societies (e.g., Preceramic Huaca

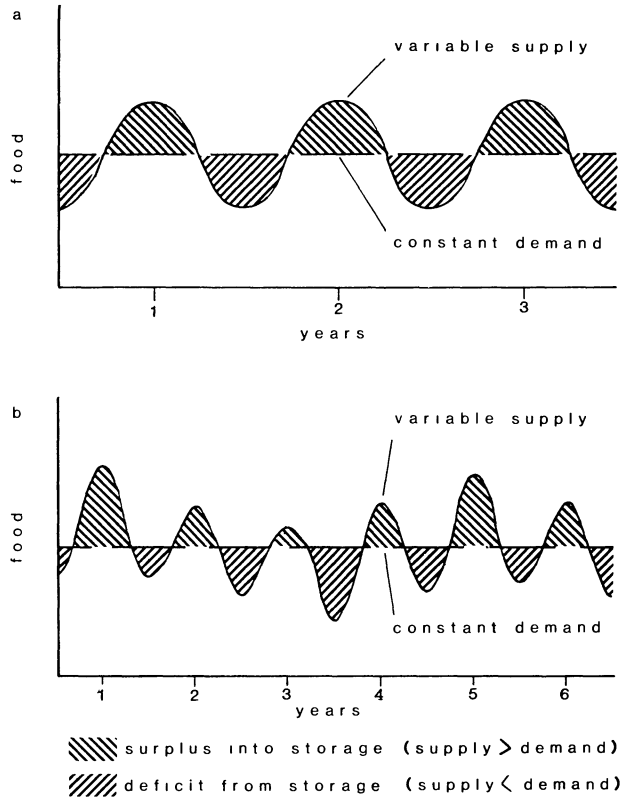

FIG. 1. Schematic representation of the function of storage in the subsistence economy: to bridge the gap between variable supply and constant demand. *a*, annual cycle with no year-to-year variation; harvest in one year provides food until the next harvest; *b*, annual cycle with year-to-year variation; harvest in good year (e.g., 1) is partly carried over for use in bad year (e.g., 3).

Negra [Strong and Evans 1952:19], Early Intermediate Moche [Bawden 1982:310], central Peruvian highland groups from the Early Intermediate Period through the Late Horizon [Browman 1970:262–65; Earle et al. 1980:22; Lavallée and Julien 1973:47–48], and Chimu [Topic 1982:153]). This tactic continues to be important today in rural households (Werge 1977).

Storage may also serve the local community as a hedge against random fluctuations in domestic food availability (fig. 1*b*). Possible ethnographic examples include storage of dried maize among the Hopi and Zuni (Stevenson 1905:352; Hough 1915:62; Forde 1931:393; Bradfield 1971:21) and of fermented breadfruit among the Marquesans (Handy 1923). Many groups, however, do not normally carry stored goods past one season despite having developed extensive systems of household storage (e.g., the Gwembe Tonga [Scudder 1962], the Trobrianders [Malinowski 1965]). The avoidance of storage from year to year probably reflects the high loss rate from spoilage with most traditional storage technologies. In Ghana, for example, the loss rate for maize is about 30% per year, although it is considered one of the most storable crops (Nyanteny 1972). Only crops that keep well with minimal treatment or that can be treated in bulk with traditional techniques, such as freeze-drying of potatoes, are suitable for storage past one season without prohibitive losses. Highland Andean peoples may have had the capacity to store household foods over several years because of the importance of maize and the development of freeze-drying techniques (see Morris 1981).

In the political economy of a complex society, storage often plays a critical role in economic management. The formation of institutions, such as governmental bureaucracies, the military, and religious hierarchies, requires a constant and reliable supply of materials. When these institutions are financed primarily by staple production, storage facilities are usually necessary. Polanyi (1957:254; cf. Thurnwald 1932:108) has noted that the staple finance of the ancient states of Egypt, Sumeria, Babylonia, and the Andes (see also Morris 1967, Anders 1981) relied on massive storage systems. Storage in state finance was also important in the Aegean during the Bronze Age (Renfrew 1972:190–96, 287–88). Centralized storehouses were often built in conjunction with administrative and religious centers to supply permanent and temporary personnel and to meet the demands of ceremonial feasting. The storage facilities serve essentially the same averaging functions as the household granary. Their scale and significance differ radically, however, because they are used to guarantee the independence of the institutions funded through political finance. The effect of concentrating this matériel is thus to consolidate the power of the central authorities who control access to it.

It should be noted that massive storage is not a necessary element of staple finance but partially an outcome of seasonality in availability. Where seasonality is minimally important, as in tropical forest environments, central storage can be deemphasized. Traditional Hawaiian society, for example, was a series of highly developed chiefdoms (or simple states) in which non-food-producing personnel included an aristocracy, managers, and craft and military specialists (Sahlins 1958:13–22; Goldman 1970:200–242). To support this personnel, large amount of food, labor, and raw materials were mobilized through a hierarchy based on land tenure and the careful management of production (Earle 1978). What is striking is that this system of finance required little central storage because the dominant staple—irrigated taro—was produced throughout the year and crops could be left in the fields until needed. Where seasonality is an important feature of subsistence production in the political economy, however, the intensification of agriculture associated with the rise of early states exacerbates the risks involved in relying on such crops, because of a reduction in the complexity of the agricultural base (i.e., by increasing dependence on a limited crop mix). This is especially critical for a complex state with a high proportion of non-food-producers to food producers, in which a large segment of the population may not be able to rely on fall-back household agricultural storage.

In our description of the role of storage in the subsistence economy, it was assumed that the need for storage reflected variation in supply while demand/use was fairly constant (see fig. 1). In the political economy, however, demand/use also fluctuates. First, seasonal part-time labor places peak demands on state stores at specific times, especially during the agricultural off-season, which is the time of greatest food supply (fig. 2*a*). Second, annual fluctuations in demand reflect such changing conditions as the financial needs of warfare and welfare (fig. 2*b*). War often places unexpected and unusually high demands on a region's resources. In archaic and traditional societies, it generally occurs during the agricultural off-season, when the demands of food production are minimal. For example, planned warfare in 17th- through 19th-century Dahomey was conducted after the harvest (Polanyi 1968), and the Yucatec rebellion (Reed 1964) and the Inka siege of Cuzco (Santillán 1968 [1563–64]: 114, 116, 132) failed in part because of the combatants' need to tend their crops. Welfare, as in the state's support of a destitute population undercut by major drought, can be equally demanding. The temporal demands on storage for this purpose are not restricted to the agricultural off-season, however, and may be concentrated during the planting and cultivation season, when household stores are most depleted. Examples of this include the opening of central Aztec storehouses during the famine of the year One Rabbit

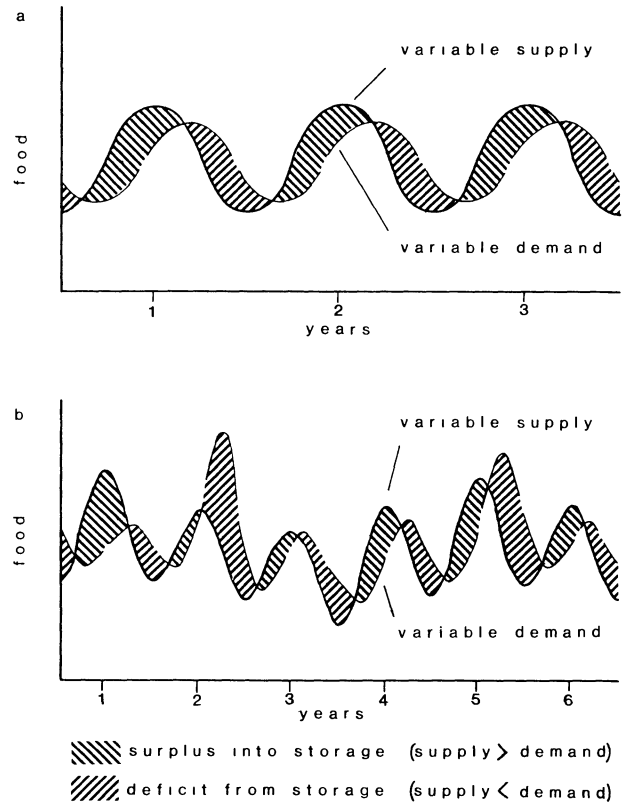

FIG. 2. Schematic representation of the function of storage in the political economy: to bridge the gap between variable supply and variable demand. *a*, annual cycle with no year-to-year variation; supply from harvests is used to pay for laborers during the off-season; *b*, annual cycle with year-to-year variation; harvests in good years and low use are stored for years with poor harvests and/or high use.

(Hassig 1981:177) and similar use of Inka stores in time of local shortfall (Garcilaso 1960 [1609]:382; Cieza de León 1967 [1553]:63; see Murra 1980 [1956]:130–34).

When comparing the seasonal and annual fluctuations in figures 1 and 2, the main point to observe is that the gap between income and expenditures is at times proportionally much greater for the institutional finance because of the fluctuating demand. For this reason, the development of the new institutional forms of statehood is often dependent on the development of effective systems of storage. In addition, the mechanisms complementary to storage that are used in a subsistence economy (e.g., reliance on kin ties or diversification of food sources) are undesirable or impracticable for a state, because they create a dependency on external sources of finance that may not be available quickly enough (if at all) to respond to a major shortfall. Interdistrict movements of goods are possible (see, for example, Wachtel 1982:214), of course, and the ecological diversity in an extended empire such as that of the Inkas offers alternative food sources. However, long-distance movement of staples is labor-intensive and cost-ineffective and appears to have been of less importance than storage in regular management of the state economy.

As noted above, the importance of storage in the political economy also reflects the central problem of economic and political control. Control of storage in a staple finance system is equivalent to control of the economy and hence the dependent population. In a household economy, a family uses storage to retain control over its subsistence base and economic survival. In a state, the control of central storage by the government implies control over all people who depend on the stored goods for their livelihood. This includes both part-time workers for the state and households relying on the safety provided by state support. The development of central warehouses in the agrarian state is thus a key element in the centralization of power and direction within the society. The importance of storage in social control was clearly articulated by David Malo, a Hawaiian chief who grew up in the court of the paramount chief Kamehameha (1971 [1898]:195):

> It was the practice of kings (*alii nui* or paramount chiefs) to build houses in which to collect food, fish, *tapa, malo, pa-u,* and all sorts of goods.
>
> These store-houses were designed by the *kamaimoku* (chief counselor to the paramount) as a means of keeping the people contented, so they would not desert the king. . . .
>
> As the rat will not desert the pantry (*kumubraka*) where he thinks food is, so the people will not desert the king while they think there is food in his store-house.

INKA STATE STORAGE IN THE UPPER MANTARO VALLEY

The rapid expansion of the Inka empire created wide-ranging problems of finance for the state administration. As discussed above, to effect control over its subject provinces, the Inkas developed a system of subordinate political units, each relatively independent of the others but owing allegiance to the central authority at Cuzco. Partially as a consequence of this, the staple finance economies of the provinces functioned autonomously to a great extent (see Morris 1967, 1972). The labor tax was assessed by governors within provinces, and the staples accumulated through the tax were stored in warehouses at the state administrative centers and stations where the goods were to be used.

According to oral tradition, the state storage system originated in the mid-15th century when the emperor Pachacuti ordered facilities built to expedite the construction of Cuzco (Betanzos 1880:75, 77). Additional storehouses (*qollqa*) were built at provincial centers and at roadside way stations over the following century (Garcilaso 1943 [1609]:238–39). Recent archaeological and ethnohistoric research has provided significant insight into some of the organizational and technological features of the state storage system (e.g., Morris 1967, 1972, 1981; D'Altroy 1981; Earle and D'Altroy 1982). This research has additionally demonstrated the concentration of state activities funded by stored goods at provincial centers, where we would anticipate the concentration of those goods.[3]

As yet, however, the intraprovincial organization of the staple finance system has not been addressed as a function of collection and disbursement of supplies. To examine the intraregional organization of this system in detail, we will discuss the state storage system in the Upper Mantaro Valley of the Peruvian central highlands. This valley, conquered by the Inkas about A.D. 1460, was critical both in terms of troop movements and population concentration and in terms of grain production to the central part of the empire. In the period just prior to the Inka conquest, the native Wankas comprised a series of competing political units (LeBlanc 1981). The total population probably approached 200,000 (cf. Cook 1975, 1982), although estimates range from 135,000 (Rowe 1946:184) to 243,000 (Smith 1970). Under the Inkas, communities moved down from their hilltop locations to live in a more dispersed settlement pattern along the valley margins (LeBlanc 1981). At the same time, the Wanka polities were drawn into state gov-

[3] An exception to the localized consumption of stored agricultural products has recently been documented for the Cochabamba area of Bolivia. According to early sources cited by Wachtel (1982), the maize produced here was intended for consumption by the military in other areas of the empire, with transport being provided by llama caravan. This appears to be an exceptional case, however, most likely because of the extremely high costs and inefficiency of maintaining such a system.

ernment through a policy of centralizing local authority and inducting Wanka elites into the state administrative structure (D'Altroy 1981). In the process, the Wankas were organized into three provincial subdivisions (*saya*). Each of these was headed by a Wanka paramount elite, who held the office of *hunu kuraka,* or leader of 10,000 households (roughly speaking), in the imposed Inka decimal hierarchy (Toledo 1940 [1570]).

The main Inka highland highway from Cuzco to Quito ran through the valley, with its provincial capital of Hatun Xauxa. Smaller state settlements were built along the road to support transient state personnel, and stations were established to control traffic and to provide message service (D'Altroy 1981; see Morris 1972).

The basis of the staple finance system in the region was the labor tax described above for the empire in general. In 1582, the Wankas reported in a Spanish inspection that they had, in effect, been required to produce staples for the state (Vega 1965 [1582]:169):

> . . . they [the Wankas] were sent to tend fields of food and [to make] clothing and maids were named for their wives; and native clothing and all [things] that they could produce were ordered put into storehouses, from which gifts were made to soldiers and to the lords and to the valiant Indians and to whomever appeared; and similarly, it was ordered that those who worked in their fields and houses receive something from the storehouses.

The Wankas were thus characteristic of many highland groups in that their corvée labor provided the basic intraregional support for the military, the elites, state laborers, and retainers.

The state storage complexes in the Mantaro Valley had greater storage capacity than any comparable facilities in the empire. In the 50 kilometers of the valley's length, the state built between 2,500 and 3,000 storehouses (D'Altroy 1981; Browman 1970:262–65; Parsons and Hastings 1977; cf. Earle and D'Altroy 1982). In the northern half of the valley, which comprised the research area of the Upper Mantaro Archaeological Research Project (Earle et al. 1980), there were 29 complexes containing about 122,000 m^3 of storage space in about 1,950 structures. The storehouses thus had the capacity to store about 1,500,000 bushels of grain, tubers, or other food. Archaeological test excavations in six structures in the main storage facilities above Hatun Xauxa have recovered the remains of all the major highland crops: maize, potatoes, quinoa, and lupine (D'Altroy and Hastorf 1984). From documentary sources, we know that the Inka *qollqa* housed a vast array of utilitarian and prestige commodities besides food, such as military supplies, rough and fine clothing, sandals, and firewood, although we do not yet know what proportion of the storage space was allocated to the various types of goods (Cieza de León 1862 [1551]:397; Espinoza 1971 [1558–61]).

The administrative center Hatun Xauxa was the focus of the state's regional activity. The first Spanish travelers who passed through the valley in 1533, when it was still under Inka control, reported that the Inka army, estimated at 30,000, was garrisoned across the river from the center and that 100,000 people were assembling daily in its streets (Estete 1917 [1532–33]:96–97). Cieza de León (1882 [1551]:432) later recorded that smiths and *aqllakuna* had been present and that 8,000 laborers were available for the service of the temple and the elite residences.

Given that the state storage system was centrally controlled and that Hatun Xauxa was the focus of state-funded activity, the distribution of storage might be expected to reflect two interdependent aspects of the provincial state economy. First, storage should be concentrated at the administrative center. Second, the distribution of state-funded activities should be a function of distance from the center, particularly if transport costs of bulk goods were a significant factor in state planning.

Both of these expectations are met. Over half the regional storage capacity (about 64,600 m^3) is concentrated within 1.0 km of Hatun Xauxa. The remaining storage capacity is distributed in systematically decreasing amounts as the distance from the center increases. In fact, we can account for about 79% of the spatial distribution of storage as a function of distance from Hatun Xauxa (see Earle and D'Altroy 1982 for a detailed discussion of this point). The implication is that state funding of work was strongly tied to a system of central economic control, with transport costs apparently being important to the disbursement of staple support throughout the valley.

It is intriguing to observe, however, that the distribution of the state storage complexes is not a function of the distribution of the local communities. The largest concentration of Wanka population in the immediate vicinity of Hatun Xauxa—in the Yanamarca Valley to the northwest—is not associated with state storehouses. While we do not yet understand the reasons for this, it is apparent that the state was not simply organizing its storage capacity to conform to the distribution of the sources of corvée labor.

To summarize our discussion of the Inka staple finance system and storage, staples were the principal source of funding for the intraprovincial economy. The high cost of transport and the consistent but occasionally unpredictable need for large quantities of staples made concentrated storage the most reasonable solution to the problem of supporting state personnel within each largely autonomous province. The organization of storage within a province can be used to estimate the spatial distribution of state-supported activities. These activities, while centrally focused, are not restricted to the immediate environs of the administrative center. Further, the distribution of storage facilities is not a clear function of the distribution of the local population. While we understand a great deal more about the organization of staple finance and storage now than we did prior to Morris's (1967) important first work, it is clear that much work remains.

WEALTH FINANCE IN THE INKA POLITICAL ECONOMY

Wealth finance, as noted above, involves the use of valuables, primitive money, or currency as means of payment of taxes or tribute to a central authority, which then uses these goods and others manufactured by attached specialists to fund governmental activities, particularly political services. We are deliberately extending the term to include goods that have previously been treated solely as prestige objects in the Inka economy, because their role appears to have included some monetary features. In Inka and other societies heavily dependent on staple finance to support state activities, wealth finance plays a complementary role. It economically integrates the managerial ranks, consisting primarily or partially of subject elites, into the central state authority structure. Goods move directly to the state and are paid out by the central authorities for political services.

The utility of valuables and of special- and general-purpose money in facilitating economic transactions has been extensively discussed elsewhere (see, for example, Dalton 1967, Schneider 1976, Earle 1982), but several points bear repetition here. The first of these is that a state may increase the efficiency and control of its political finance system by shifting toward wealth finance. The use of goods with monetary characteristics reduces state costs in proportion to the value of the goods being transferred. Transport costs are reduced, wealth goods being lighter and more readily transportable than staples. The costs of management are also diminished, since fewer storage facilities and fewer personnel are needed to manage such facilities.

A tax or payment for services also reduces the proportion of the finance lost through decay, since wealth goods are typically less perishable than staples. An additional key benefit of wealth finance is that it provides the means of interregionally integrating the economies of the state's disparate ethnic groups. A generalized medium of payment facilities collection and transport of taxes and the payment of government obligations among provinces.

For example, the Aztec state actively promoted the use of craft goods and exotic valuables as currencies in the tax-tribute system and the central highlands marketing system. Even in provinces that did not grow cotton, the state often required tribute of *quachtli* (white cotton cloth). These textiles, which appear to have lost their use function over time, were used in state-administered foreign trade and in market transactions for fine clothing and luxury raw materials, the latter available through ports of trade outside of the Aztec heartland (Chapman 1957; Berdan 1975:292). Similarly, some Aztec campaigns may have been directed to the conquest of cacao-producing regions, the beans being a key medium of exchange in highland markets (Berdan 1975:297). The production and distribution of these goods were promoted by the state elites, who used them in part to obtain subsistence products from specialized agricultural communities in the Valley of Mexico (Brumfiel 1980) and to pay off political and military debts.

In the Andes, the circulation of prestige goods was widespread millennia before the rise of the Inka state. For instance, during the Early Intermediate Period (ca. A.D. 100–600) and before, precious metals (e.g., gold and silver) from the central and northern highlands, *Spondylus* shell from south coastal Ecuador, feathers from the tropical forest, and semiprecious stones (e.g., chrysacolla, lapis lazuli), some of which came from the southern highlands, were circulating in long-distance exchange networks (Earle 1974, Paulsen 1978, Shimada 1982). Given the known circulation of these and similar wealth goods prior to and under the Inkas, it is reasonable to ask to what extent, if any, the Inka state was employing these goods as special-purpose media of tribute and as payment for services. The evidence on this point is limited and often regionally specific, but sufficient information exists to permit some preliminary conclusions concerning the state's use of such goods in the management of the political economy.

Before entering this discussion in detail, however, we should anticipate two possible objections to our argument. First, we do not imply here that the Inka state was actively promoting a market economy comparable to that of the Aztecs (La Lone 1982; cf. Hartmann 1971). Barter did, as we have said, occur beneath the political economy, but widespread market exchange seems to have been primarily a north Andean phenomenon (Salomon 1978*a*, 1983), with some elements of entrepreneurial exchange occurring on the central and north Peruvian coasts (Netherly 1978; Rostworowski 1978, 1981). Second, the imputation of monetary characteristics to goods whose transfer is often couched as gift giving does not preclude their serving other functions. The combination of social, ideological, and economic features is typical of special-purpose moneys (Dalton 1977), and it would be surprising if Inka wealth did not share this feature. The Aztecs' cacao and *quachtli* are just two examples of such consumable currencies in a complex state economy.

In general, wealth goods were mobilized in the Inka state in two ways. The first of these was through direct prestation of finished products in the form of obligatory gifts from local elites to the state or taxes on economic specialists. These goods included shell beads (Salomon 1978*a*), various gold, silver, and copper objects (Cobo 1956 [1653], vol. 3:291), and unfinished *Spondylus* shell (Murra 1975; 1982:249). The second was through conversion of staples into wealth objects by support of craft specialists attached to the state (see below).

The increased importance of the control of wealth by the Inka state appears to be exemplified by the distribution of metals recovered in our Mantaro Valley excavations. Preliminary analysis of the metals recovered through 1982 suggests a major contrast between the latest phase of the Late Intermediate Period (Wanka II: ca. A.D. 1350–1460) and the Late Horizon (Wanka III: A.D. 1460–1532, during Inka domination). These data come from household groups we have been excavating at four sites: two (Tunanmarca and Umpamalca) represent Wanka II, and two (Hatunmarca and Marca) represent Wanka III. The change in distribution of metals is clearest in terms of the materials themselves (table 1). While both copper and lead increase in occurrence, silver becomes less common. Assuming that lead is a by-product of silver production (a point we are currently trying to document), silver production in the Mantaro region appears to increase at the same time that finished silver products become quite rare in Wanka sites. To what can we attribute this change? Most likely, the silver production is becoming directed toward the state, which is removing it from local use. Ethnohistoric sources (e.g., Cieza de León 1862 [1551]:432) speak of silver manufacture at the local Inka administrative center, Hatun Xauxa; however, the silver was apparently not destined for general local consumption.

The combined archaeological and documentary information for the Xauxa region suggests that metal products may have flowed to the state through (1) metal procurement and production systems in which the local elites played a controlling managerial role through their own attached specialists and (2) systems in which the state controlled all aspects from mining to final disposition of the finished products. The evidence for increased ore processing at the local communities, particularly in elite areas, suggests an increase in metal manufacturing managed by local elites. It is not clear, however, whether the products of this work were transferred to the state as finished products or as refined metal ready for conversion into finished products by attached specialists (Cieza de León 1862 [1551]:432). We consider it possible that the two systems functioned simultaneously for different metals and for different finished products. Current field research may shed more light on this issue.

Two ethnohistorically documented cases of the use of wealth goods by the Inkas to finance relations with subject elites are also pertinent here. The first case involves the cooption or

TABLE 1

PERCENTAGE OF EXCAVATED PROVENIENCES (UPPER MANTARO ARCHAEOLOGICAL RESEARCH PROJECT 1982 FIELDWORK) YIELDING METALS IN WANKA II (PRIOR TO INKA CONQUEST) AND WANKA III (DURING INKA DOMINATION)

	N PROVENIENCES	% SILVER	% LEAD	% COPPER
Wanka II	473	2.3	0.2	1.5
Wanka III	433	0.2	1.6	5.1

integration of semimonetary and material tribute systems into the state political economy in relations with societies in which they were already present. The most clearly defined case for this is in the highlands of Ecuador, although state-local relations on the central Peruvian coast may have been similar. The second case involves the massive production and promotion of more generally used wealth objects, especially *kumpi*, or fine cloth.

In an incisive study of highland societies of Ecuador prior to and under the Inkas, Salomon (1978*a*, 1983) has observed marked differences in political and economic organization from societies of the central Andes. Prior to the Inka conquest of the region in the late 15th and early 16th centuries, the societies were fairly small, independent polities that Salomon calls chiefdoms. Rather than drawing their basic support from internal production, as was the ideal in the central and southern Andes, the communities were integrated into complex exchange networks. This included market exchange, particularly in special products such as salt, coca, pepper, and cotton. Various kinds of money, such as polished gold buttons (*chaguales*), copper axes, and shell beads, also circulated within the region. These were graded in value and were variably convertible into subsistence goods in market exchange by commoners, elites, and trading specialists.

Two features of this economic organization are especially interesting here. First, the local lords received direct payment of tribute in the form of *mantas* (cloth), gold, shell beads, bone beads, copper axes, and coca. These goods moved freely up and down the political hierarchy and were used as means of payment for political services as well as for purchase of goods in the market. These goods thus played a role in underwriting the local elites' relations with other communities and within their own hierarchies. Second, there was a hereditary merchant sector (*mindalaes*) that trafficked in wealth goods (see Salomon 1978*b* for a comparison with Aztec *pochteca*). They paid no tribute in labor but paid the local *caciques* (elites) in gold, *mantas,* and beads and perhaps coca and salt. The amount to be paid was calculated as a portion of their trade goods.

When the Inkas conquered the Ecuadorian highlands, they established Quito as the northern capital of the empire and laid an additional level of political organization over the local elites. In addition to establishing state lands for production of staples, the state usurped the elites' rights to a portion of the wealth tribute that had previously flowed into their hands. Salomon (1983) observes that the more distant Pasto groups had a much more widespread *mindalá* sector than did the communities surrounding the Quito and Otavalo areas, which had been integrated more fully into the Inka state as a result of their domination for several decades. In the latter areas, the traders were coopted and regulated by the Inka state as a means of ensuring the controlled flow of sumptuary items, such as shell beads, from areas that the Incas systematically failed to incorporate, including the Ecuadorian coast.

The key point to be taken from this Ecuadorian example is that the Inka state adapted a monetized tax/tribute system, associated with an indigenous market economy, to its own needs in the northern part of the empire. In effect, the goods to which the Inkas coopted access from the local elites were used to pay these same elites for political services to the state. The Inkas concentrated the merchant sector under their control not to eliminate its activities within the regional economy but to exploit it as an efficient means of generating funds for the political economy.

Salomon (1983) points out that a comparable situation may have existed in the central Peruvian coastal Chincha Valley, where an ethnohistoric source from 1570–75 records the presence of a class of merchant traders (Rostworowski 1970). These traders were apparently allowed to maintain an independent status under the Inka state. They circulated from Guayaquil, Ecuador, to the Ica Valley of southern Peru and traveled to Cuzco, bringing, among other goods, various raw and finished *Spondylus* products into the central Andean economic sphere. The *Spondylus* was especially important to the Inkas and their subordinate polities because it was extensively used in rituals designed to induce rain and to make springs flow (Paulsen 1974; Murra 1975:257; Marcos 1978). Whether the Chincha merchants were independent entrepreneurs under Inka rule, as Rostworowski (1970) suggests, or whether they served as delegates of administered trade is not clear. The important point is that the Inka state recognized and exploited an established trading institution to provide wealth goods to the central authorities, who could then distribute them to subordinate elites as part of payment for service to the state.

The second general case for the use of wealth finance in elite-state relations lies in the state-subsidized and controlled manufacture and circulation of sumptuary goods. The outstanding example of this occurs in the production and distribution of fine cloth. Murra (1962) has detailed the role of textiles in the Andes under the Inkas, showing its pervasive significance in many social, political, and economic situations. For instance, cloth was given in bridewealth, presented as gifts at weaning, buried in mummy bundles, sacrificed in rituals, and used as a status marker. Of importance here is the systematic presentation of cloth to subordinate elites for political services and economic management. In an inspection of the province of Chucuito in 1567, it was reported that the predecessors of Martin Cari, the paramount of the *parcialidad* (sociopolitical division) of Anansaya, received 50 to 100 pieces of cloth per year from Inka state warehouses. The cloth, presented in addition to a wide range of other goods and services, was for the consumption of the *kurakas,* their families, and the travelers passing through (Diez de San Miguel 1964 [1567]: 25, 34). It is not clear what (possibly variable) proportion of the cloth and other goods was at the personal disposal of the paramount and what proportion was consumed by state travelers, but the fact remains that the cloth was a perquisite of office. Further, the subordinate elites of the *parcialidad* of Urinsaya reported annually giving up to 35 pieces of cloth of their *own* wool (about half *kumpi* and half *awasqa* or rough cloth) to the paramount, Martin Cusi, in addition to the cloth woven from his wool (Diez de San Miguel 1964 [1567]:33). The paramount thus had access to fine cloth through systematic awards from the state, less systematic presentations from subordinate elites, and weaving by the community and his own household.

The state produced fine cloth through two basic mechanisms. The first was as part of corvée labor production, in which craft specialists made cloth from wool provided by the state as their labor tax. The second was through the growing system of displaced colonists and specialist female weavers employed full-time by the state. The colonies of craft producers included weavers, such as the inhabitants of the town of Lamay, near Cuzco, at which a Wanka *kumpi kamayoc* (master weaver) reported that his father had held the position of *pichqapachaqa kuraka,* or head of 500 households (loosely speaking) (Toledo 1940 [1571]:159). Other attached craft specialists included potters, such as those from the 14 ethnic groups represented at Wayakuntu or the north coastal potters relocated in Cajamarca (Espinoza 1973). Similarly, the Inkas transported the Chimu metalsmiths wholesale to Cuzco to produce for the state after taking control of the north coast (Rowe 1948). Other cloth producers recorded archaeologically include those who occupied a compound at Huánuco Pampa at which a high concentration of spindle whorls was recovered (Morris 1974:103).

The state's production and distribution of cloth is clearly too

complex an issue for us to address fully in this paper. However, without pushing the point too far, it seems reasonable to view some Inka cloth as a special-purpose money, circulating in a restricted sphere of exchange (Bohannan 1955). In this sense, *kumpi* may be analogous to the Aztec *quachtli* but less generalized and less easily convertible to other goods. That is, the cloth served as a standard of payment for service to the state in a limited sphere of exchange relationships.[4] It is important to note that this cloth flowed in *both* directions, from the local elites to the state in the form of obligatory gifts and back from the state as part of payment for work rendered in office.

The state's heavy investment in the production of fine cloth has two significant implications for our argument. First, the state was structuring economic relations with its subordinate elites in terms of a flow of valuables. By investing high value in certain commodities, the state could minimize transport costs for tax relations with subject elites, and interregional integration of disparate subject polities could be controlled through a state-regulated system of wealth manufacture and payment. Second, the state's control over the circulation of these goods allowed it to set their value within the political economy. Whether a system of exchange equivalencies existed is not clear, but within the sphere of exchange of political services and valuables/special-purpose money, the state controlled access to the wealth associated with power.

In an analogous fashion, the state controlled a large portion of the production and distribution of a specialty crop, coca. The state maintained fields of coca in the *yungas* (coastal piedmont) and in the *montaña,* cultivated by designated laborers, often *mitmaqkuna.* As part of the regular dole to corvée laborers, the state and local elites provided a ration of coca (e.g., Diez de San Miguel 1964 [1567]:22, 82), whose amount is unclear. Basing her account on ethnohistoric sources, Rostworowski (1978) has suggested that coca was one of several (consumable) currencies circulating on the central coast of Peru during Inka hegemony and may have been used as a medium of exchange to obtain metals from neighboring highland people. Salomon's (1978*a*) work has documented that coca served as a currency in highlands Ecuador into the colonial period. Similarly, we have seen that coca was produced as a specialty crop on the eastern side of the Andes in the early colonial period, with the intent to exchange it for other subsistence or specialty goods, such as salt (Burchard 1974, Ortiz de Zúñiga 1967–72 [1562]).[5] While the state's mass production and circulation of coca may be viewed as part of its ceremonial hospitality, it also suggests a state interest in providing a good to its workers that was valued both for its use as a comestible and as an item with recognized exchange value.

From the foregoing, we may argue that the Inka state promoted and employed circulation of wealth goods in its finance system both with groups that were marginally incorporated into the empire politically (Ecuador and coastal Peru) and with groups that were intensively integrated into the state. As mentioned earlier, the Inka state attempted to retain control over regions by compartmentalizing them economically and establishing strong vertical ties between the ruling Inka and the regional elites. Control of valuables was of course instrumental in establishing and maintaining these vertical ties in the Inka state as it was in the Aztec (Brumfiel 1983).

CONCLUSION

We have attempted to lay out some of the conditions affecting an archaic state's political finance policy. We have argued that the requirements of gross production and the constraints of security and of management costs will lead the state to develop a finance system based on production and circulation of both staple and wealth goods. The staple finance system will be largely focused within a region, because of the regular and stochastic needs for large-scale funding of personnel throughout the state's territory and the prohibitive cost of transport among regions on a regular basis. Regional concentration of storage is therefore a highly adaptive strategy for a territorially expansionist state. At the same time, it creates a major problem; the stored goods may be used to fund rebellion against the state. For example, in the Mantaro Valley, from the Spanish arrival in 1533 until 1554, supplies from the massive warehouse complexes were given by the local leaders to support the Spanish war against the Inkas (Espinoza 1971 [1558–61]). Decentralized finance may thus result in weakened controls from the administrative center.

We have also argued that the organization and allocation of labor resources is not an independent variable in the state's economic planning; the use of labor depends upon the requirements of goods production and management as much as on the socioeconomic relationships between the various producing and consuming sectors of the economy. To argue that the peasants paid taxes to the Inka state only in labor may be essentially correct, but to assert that this was the sole means of state finance obscures a range of systematic economic interactions based on goods, especially among elites. To integrate the disparate provincial economies into the centralized state political economy, the Inka state adopted a complementary system of circulating wealth goods, often in a form already compatible with those in use in the subject provinces. Controlling the procurement and circulation of wealth goods was a means of interregional economic integration that was cost-effective and subject to central authority. An additional benefit to this approach, of course, was to give local elites who received wealth from the state a vested interest in the maintenance of the system.

The use of a mixture of staple and wealth finance in the state political economy allowed the Inkas flexibility in regional and interregional finance. The establishment of a separate staple finance system within each province guaranteed, as much as was possible under the agricultural conditions, the support of permanent, temporary, itinerant, and security personnel for the state. The risk of production and the variability in labor costs of the staple finance system were borne by the local populace in that cultivation of state lands took precedence over cultivation of community lands (see Mitchell 1980 for a discussion of the logistics of this problem). In return, the state provided a security umbrella in the form of concentrated storage, and, in fact, the support of corvée laborers by the state in the agricultural off-season can be viewed, in part, as a means of providing security for the local populace (see Murra 1980 [1956]).

In sum, archaic states were confronted with simultaneous problems of gross energy capture to support its dispersed activities, a need for security, and a need to integrate its subject regions into a centralized system of control. A mixed strategy of labor taxation, control of staple goods, and production and circulation of wealth goods permitted the Inka state to meet its disparate economic requirements. While we have chosen the

[4] The convertibility of these kinds of goods into subsistence or utilitarian products is an issue that has not yet been addressed, largely because of a lack of data on the topic. Wealth goods, such as *kumpi,* were directly and indirectly (e.g., through Spanish coinage) convertible into other types of goods in the early colonial economy. While it is possible that such conversions took place prior to Spanish contact, this point cannot be demonstrated with current information, and we do not wish to assert it here.

[5] Acosta (1894 [1590]:294) reports that the Andean peoples used coca and, in the Santa Cruz area of eastern Bolivia, cotton cloth as currency. Murra (1980 [1956]:143) has expressed reservations about the accuracy of this passage for pre-Columbian economies, and we share them in part, because of the general content of the passage.

Inkas as a case to demonstrate our argument, we feel that the reasoning presented should also apply to other preindustrial states.

Comments

by DAVID L. BROWMAN
Department of Anthropology, Washington University, Campus Box 1114, St. Louis, Mo. 63130, U.S.A. 12 x 84

The concept of "finance" is an important one. D'Altroy and Earle have highlighted an aspect of prehistoric economies that archaeologists frequently overlook. In the case of their Inca model, some of the simplifying assumptions they make are not completely warranted. I shall present unpublished data on the Huanca federation of the Mantaro Valley (the focus of their type example) that enhance one part of their argument while requiring modification of others.

D'Altroy and Earle admit that the distinction between "staple" and "wealth" products is largely heuristic. Nevertheless, the idea as developed tends to confuse commodity with subsistence goods. Distinguishing staple from wealth items causes difficulties because many of the goods in the Inca storage network labeled "staple" were the items that the managerial personnel mobilized as "wealth." The Inca empire included a vast array of different economic systems. Like the proverbial blind men confronting the elephant, each Inca scholar comes away with a different reification of the economic system.

The vertical ecology here viewed as the integrating mechanism of the Inca economy is only one of its aspects. D'Altroy and Earle state that the "apparent ideal was to integrate the distinctive economic zones within a single community through autonomous production and reciprocal exchange, an organization that circumvented the need for extensive market exchange." This exclusion of the market principle (see La Lone 1978, 1982) ignores the clear existence of the market principle in a large sector of the Inca empire (see Brush [1976] on the northern highlands, Browman [1977, 1982, 1984] on the altiplano, Salomon [1978*a*, *b*] on Incaic Ecuador, and Netherly [1978] and Rostworowski [1970] on the Peruvian coast). For example, among the Chincha mentioned by D'Altroy and Earle, out of 30,000 taxpayers or heads of households, between 6,000 and 10,000 were merchants (Rostworowski 1970, Lizarraga 1609), trading extensively with the altiplano as well as with other coastal areas. Another 10,000 to 12,000 of these Chincha household heads were listed as boat owners and could equally well have engaged in transport of merchandise as in fishing. The acceptance of vertical exchange as *the* appropriate model for analysis of Inca staple and wealth finance is unfortunate.

In developing the argument for staple finance, the authors note that subsistence goods were produced on state lands either alienated from local communities or created through agricultural intensification and that the Inca state "arrogated to itself the rights to all productive resources." Two implications of this argument need clarification. The agricultural-intensification argument appears to imply that the Inca created most of the terrace and irrigation systems they used. In fact, many of these systems were in place long before their time, though the Inca did enlarge and extend them. The notion of their "arrogation of rights to all productive resources" has been employed elsewhere to argue that the herds of the Inca were all state property—that there was therefore no pre-Columbian pastoralism. Although Murra was earlier a supporter of this concept (1980 [1956]), his later work with the Lupaqa (for example, Murra 1975) showed that there were many privately owned herds and that in the major pastoral areas private ownership predominated over communal holdings and herds reserved for state functions. Caravan owners petitioned the local authorities for permission to undertake trading ventures, for which they paid a "tax" or fee to the local functionary in the form of goods procured on the trading venture. Similarly, land title was divided between private, communal, and state holdings. While the state extracted a portion of the surplus from all holdings, the mechanism for that extraction varied from one ethnic group to another.

D'Altroy and Earle indicate that only secondarily are they concerned with the state's control of labor. Their repeated statement that the labor tax was assessed on a rotating basis thus may be viewed as simply shorthand for the fact that certain types of labor tax were assessed annually on all households while other types were assessed on a rotating basis with respect to age-grades. The focus upon centralized storage as a part of the financing of state activities obscures its importance as a means of risk avoidance. In the southern Andes, local lore, reinforced by modern agronomic studies, indicates that there is a good harvest only one year in seven. Thus storage of staples is a major mechanism of risk reduction, not state finance, in this zone. There are two very well-known large agricultural areas in the sierra where climatic risk is minimal and where land and water management can predictably yield substantial harvests: the Cochabamba Valley and the Mantaro Valley. Thus the Mantaro example developed here is a special case.

The discussion of staple finance is the strongest part of the argument, focussing attention on a critical and underappreciated aspect of the Inca economy. I have more difficulties with the wealth-finance portion of the argument. Part of it derives from evidence from the coastal areas and Ecuador, where market behavior was quite different from that characteristic of the sierra. Part of it is based on the manipulation of wealth in silver, gold, coca leaf, and the like. The available evidence indicates that in the sierra, silver and gold usage was often limited to Inca palaces and temples. To be a wealth good an item must be capable of use by the nonagricultural managerial personnel, but it is not clear that this was the case in the sierra. (In contrast, managerial personnel of the market areas of the Peruvian North Coast had substantial access to gold and silver wealth.) Wealth finance here focusses on light, portable special products. Murra (1962) and others have repeatedly made the point that the most important valuable in the Inca state was cloth—clearly a very bulky and transport-expensive good, not qualifying as a "wealth" good as defined in this paper. In the Xauxa area the first Spanish chroniclers (Estete 1533, Sancho 1534) were bemused by the fact that the retreating Inca burned large quantities of cloth to keep it from the Spaniards while leaving the gold and silver behind. Coca leaf's importance as wealth is considered by historians to have been greatest during the development of the silver trade from the Potosí mines—that is, in postconquest times in the southern Andes (in preconquest times, coca leaf is best known as a commodity in the market situations of the coast and Ecuador).

The distinction between "wealth" and "staple" finance does not, at this point, appear to be a very useful explicative concept as applied to the Inca. While the state assumed control over procurement and circulation of wealth goods, we cannot yet demonstrate that these were important in the sierra, where the vertical-ecology mechanisms were paramount. Rather than an Inca state deliberately establishing specific finance mechanisms, I see a more opportunistic one incorporating diverse existing systems, coopting equally the more market-oriented coastal and Ecuadorian systems, on the one hand, and the *qollqa* of the Huanca, on the other.

D'Altroy and Earle observe that I have some additional evidence on storage at Jauja (Sausa, Hatun Xauxa) that they cannot integrate into their model because my doctoral disserta-

TABLE 1

ESTIMATES OF NUMBERS OF STORAGE BUILDINGS AT UPPER MANTARO VALLEY SITES

BROWMAN		D'ALTROY	
PJuM 515	20 round	J18	18 round
PJuM 523	20 round, 12 rectangular	J57	21 round, 16 rectangular
PJuM 525	28 round	J28	21 round, 1 rectangular
PJuM 535	11 round	J29	15 round
PJuM 544	36 rectangular	J21	39 rectangular
PJuM 546	56 rectangular	J22	75 rectangular
PJuM 547	gr. 30 rectangular	J23	66 rectangular
PJuM 551	56 rectangular	J24	56 rectangular, 7 round
PJuM 554	50 rectangular	J27	43 rectangular
PJuM 558	28 rectangular	J36	19 rectangular, 19 round
PJuM 563	30 round, 4 rectangular	J35	39 round

SOURCES. Browman, 1968 fieldnotes; D'Altroy (1981).

tion (Browman 1970) is not explicit enough to allow the required computations. This missing evidence from my unpublished field notes enhances one part of their argument, and therefore I provide it here. My work in 1968 was in large part dedicated to the establishment of a working chronology for the Upper Mantaro Valley. I surveyed and recorded 302 ceramic-period sites dating from the late Initial Period (1300–1200 B.C.) through Colonial and Republican Periods (A.D. 1600s–1800s). D'Altroy's (1981) resurvey focussed on the Huanca and their storage sites. Nonetheless, the numbers of storage structures reported at various sites where our surveys overlap are roughly comparable (table 1). My counts are generally lower than D'Altroy's, no doubt being underestimates, so my additional storage data are clearly still an underestimate of the storage facilities of the Upper Mantaro Valley.

The additional data allow expansion of the ca. 122,000 m^3 of storage that D'Altroy and Earle report. D'Altroy (1981) estimated an average of 56.2 m^3 storage for the circular structures and 65.2 m^3 for the rectangular structures. He reports 1,069 buildings at the center of Xauxa (64,618 m^3) and 883 buildings outside of the center (51,155 m^3), a total of 1,952 buildings and 116,773 m^3. (This article cites 122,000 m^3 for the same 1,952 buildings, but this difference is not important.) In the remaining area of the Upper Mantaro Valley, the zones occupied by the Lurin and Hanan Huanca groups, I counted 392 circular and 342 rectangular buildings, an additional 734 buildings. My survey of the Hanan Huanca area is not complete; in 1968 I cut off just north of Sapallanga and was later chagrined to find ethnohistoric reports of large Huanca complexes to the south. Thus my count significantly underestimates Hanan Huanca storage capacity. Nonetheless, this new evidence adds 44,329 m^3 of Inca-contemporary storage to the evidence that D'Altroy and Earle present. This brings the total to 2,686 buildings, and 161,102 m^3—64,618 m^3 at Hatun Xauxa, 43,006 m^3 at other Xauxa sites, and 52,477 m^3 at Lurin and Hanan Huanca sites. (This is a conservative estimate not only in terms of building counts; I have used D'Altroy's figures of 56.2 and 65.2 m^3, just about half of my 1968 estimates of 112 and 128 m^3.) If 1 m^3 holds 23.38 bushels (my estimate, larger than D'Altroy and Earle's), then the Upper Mantaro Valley complex, with an estimated capacity of 4,572,074 bushels, is the largest storage complex known in the prehistoric New World. This new evidence thus strengthens D'Altroy and Earle's argument on the Hatun Xauxa center. None of us has yet integrated into our arguments Guaman Poma's (1956 [1615]: 252) observation that each *qollqa* corresponds to a *chacra* (field).

I believe that the Inca coopted an existing storage system in the Upper Mantaro area and enlarged it; D'Altroy and Earle believe that the Inca originated the system. My argument is based on a variety of evidence which I can only briefly list here, but it is important for an understanding of the model of the Inca economy they propose.

Judging from the presence of domestic refuse and clearly domestic architecture, a number of the *qollqa* complexes had resident managing populations. Thus D'Altroy recorded only storage facilities for his sites J20, 25, 26, 28, 29, 30, 32, and 34, but I recorded them additionally as having managerial structures, at least resident caretakers, and sometimes even significant residential populations. This difference will affect not only the estimate of storage capacity but also the argument on how the storage was managed, whether it was state or local storage, wealth finance, etc.

I found episodes of major renovation and rebuilding of *qollqa* complexes. For example, at site PJuM 576, south of the area Earle and D'Altroy surveyed, I found the remnants of 31 circular *qollqa* that had been completely dismantled and rebuilt into 19 larger rectangular ones with typical Inca abutted corners. Some sites lacked any Inca materials (and Inca occupation was quite evident in the valley, with 120 Inca sites) and had Huanca II–style Late Intermediate Period ceramics. The LIP *qollqa* complexes had a storage capacity of 723,500 bushels. While this is a significant amount, it is only ca. 16% of the later Inca storage capacity in the valley. Thus the Inca not only coopted the system but markedly expanded and improved upon it.

Part of the reason that D'Altroy and Earle consider the storage complex Inca in origin is that their research has focussed on the Yanamarca Valley just northwest of Jauja, an area which lacks *qollqa*. From the perspective of the Yanamarca Valley, *qollqa* thus appear to be an intrusion. Farther south in the Mantaro Valley, however, they are quite common and occur in pre-Inca as well as Inca contexts.

D'Altroy and Earle believe the organization of the Huanca group into three local polities—Hatun Xauxa, Lurin Huanca, and Hanan Huanca—was only an Inca imposition. Archaeological, ethnohistoric, and linguistic evidence indicates, however, that the division is pre-Incaic and thus suggests more local control of storage than they envision. Catherine LeBlanc (one of Earle and D'Altroy's colleagues) and I have compared ceramic inventories, and on the basis of preliminary evidence, different design elements seem to be diagnostic of the Hatun Xauxa/Yanamarca vs. the Lurin/Hanan Huanca area. Occurrence of *qollqa* is obviously another distinguishing feature, and dress is another (Cerrón Palomino 1976, Vega 1965 [1582]). There is today a very clear dialect difference in the valley; in the area of the ethnohistorically identified Hatun Xauxa polity Yaqa-Huanca is spoken, in the Lurin and Hanan Huanca areas Nuqa-Huanca (Cerrón Palomino 1976:29).

The data on storage facilities in the Lurin/Hanan Huanca area reported here require modification of the argument that 79% of storage in the Upper Mantaro Valley can be explained in terms of proximity to the Inca site Hatun Xauxa. The local control indicated by these new data drastically affects the wealth-finance part of D'Altroy and Earle's argument.

A census dating to the 1520s reports approximately 6,000 taxpayers or heads of households from Hatun Xauxa and 21,000 from Lurin and Hanan Huanca. Ethnographic and ethnohistoric data on family size in this area range from ca. 5.1 to 6.5 (Browman 1970). Thus the maximum preconquest population of the valley was 175,000, with no more than 40,000 in the Xauxa ethnic area. The first Spanish estimate of 100,000 for Xauxa (referred to by D'Altroy and Earle), if correct, must refer to a population inflated by the presence of the retreating Inca army. Recalling the wide range of estimates of the number of merchants at Chincha mentioned above (6,000 to 10,000), the 8,000 laborers that Cieza de León (1862 [1551]: chap. 84) reports at Xauxa might be seen as a reference to the 6,000 taxpayers of the census rather than, as D'Altroy and Earle suggest, as 8,000 laborers in a center of 100,000 who daily dedicated themselves to the service of the temple and the elite. This alternative interpretation would clearly result in different interpretations of "wealth" finance in Xauxa.

D'Altroy and Earle have given us a very thought-provoking article. The new evidence that I present here will require them to modify their model. It is neither fair nor reasonable to expect them to deal with evidence that they are seeing for the first time. My observations should be taken as directions for mutual further investigations that will help us to develop more dynamic explanatory models.

by DARRELL LA LONE
Department of Sociology/Anthropology, DePauw University, Greencastle, Ind. 46135, U.S.A. 12 x 84

D'Altroy and Earle's paper demonstrates the value of a synthesis of archaeological and ethnohistorical method for a more detailed understanding of Inca political economy and a richer foundation for research on ancient states. In doing so, they urge us to move from discussion of "the form of the institutional framework" toward more specific questions about "allocation of resources within or among institutions."

Their exploration of the energetic requirements of production and management of resources offers additional insight for questions of interest in economic anthropology as well. For example, the role of market exchange in production and distribution of staples as well as wealth items is a continuing source of debate. Some, for example, see markets as characteristic of state economies (e.g., Claessen 1978, 1984). Others question the assumption that market exchange in ancient states can be understood in roughly the same ways we understand markets in a capitalist system (Carrasco 1978, 1980; Parsons 1980; La Lone 1982). D'Altroy and Earle's paper is important also for its further contribution toward our understanding of a state political economy in which market exchange plays a minimal role.

As we work toward a general understanding of the emergence and development of market systems, one of the critical dimensions we explore is how goods are, or are not, moved between supply and demand regions. The ratio of value to bulk takes a central place in this discussion. In particular, we ask how and why staple goods are moved, especially when they are low in exchange value and high in bulk. To be even more specific, in the Andes we're often talking about potatoes, which have high transport cost in relation to their value, especially when compared with other goods such as coca. In general, what we expect to travel far in an exchange system is high-value/low-bulk items, and it is these that are most likely to be wealth items. We do not expect heavy staples to move far because of their higher transport costs.

D'Altroy and Earle raise this heavy problem with respect to the movement (or lack of movement) of staple goods by referring at several points to the "prohibitive cost of transport among regions." We might wonder why an imperialistic state should be overly concerned about such "costs" in view of its wide command over the resources of its population. D'Altroy and Earle's argument responds directly to this objection by offering energetic efficiency as a critical cost in any resource management system. Their work on the state storage system confirms what we have known for some time—that the Inca state was not in the commodity-movement business. Although this is not earthshakingly new, I look forward to further discussion of the role of wealth finance and the circulation of wealth items under the Inca. This is a topic greatly in need of further development.

On the whole, this paper demonstrates the importance of continuing reconsideration of some of the global concepts (such as "reciprocity," "redistribution," and "market") that have at times concealed more than they have revealed. Archaeological investigation of the state storage system offers insights into Inca political economy that would not have been possible through working with documents alone. When, as here, archaeological and documentary data are combined, we gain from the ability to ask new questions of the documents in view of archaeological data and new questions of the archaeological record through the detail given in documents. One promising example of such a multistage research strategy is offered in D'Altroy and Earle's preliminary analysis of the distribution of metals recovered in their Mantaro Valley excavations.

by MICHAEL E. MOSELEY
Department of Anthropology, University of Florida, Gainesville, Fla. 32611, U.S.A. 12 x 84

D'Altroy and Earle provide an insightful discussion of political economy and storage in the Inca empire. It is useful to recognize that, contrary to imperial propaganda, the emperor Pachacuti invented neither warehousing nor the basic principles of Andean statecraft. This allows the institutions discussed by the authors to be viewed in the diachronic perspective of previous polities.

With the onset of good architectural preservation around A.D. 500, free-standing walled structures that define warehousing are present at many coastal and highland administrative centers, and storage facilities for staples can be distinguished from storage facilities for manufactured goods and luxury commodities. Early architectural elaboration of such facilities is consistent with early evidence for basic institutions of Andean statecraft such as corporate administration of agricultural lands and *mita*-like labor taxation.

Structures erected for the storage of staples may be numerous and occupy large sections of some coastal sites. However, the arid conditions of the Pacific watershed did not lead to the architectural elaboration that warehousing of staples received among highland polities contending with rainfall and frost. In contrast, structures erected for the storage of manufactured commodities and luxury goods underwent substantial development on the coast. This was particularly dramatic among northern desert polities, where what the authors term "wealth finance" was highly evolved and where the political economy employed fine arts as a major medium for reciprocity among the managerial elite.

Production and storage associated with wealth finance have their greatest archaeological elaboration at Chan Chan, the imperial capital of Chimor—the largest polity to contest the Inca for Andean hegemony. Built by taxing nonresident labor, the metropolis was vast but housed a modest and specialized population. The numerically dominant urban proletariat consisted almost exclusively of artisans, particularly metalworkers. Monumental architecture that housed the governing elite had most of its roofed floor space devoted to the warehousing of fine arts.

When Chimor conquered the Lambayeque region—an area noteworthy for both metallurgical production and finely

crafted precious metal—metalworking artisans of the region were resettled at Chan Chan (Topic 1982). Documentary sources indicate that the Inca conquest of Chimor saw the resettlement of Chan Chan's metalsmith populace at Cuzco (Rowe 1948), and investigation of artisans' quarters and workshops suggests that the entirety of the skilled urban proletariat was evacuated.

This overview supports the utility of the authors' distinction between staple and wealth finance and indicates that late Andean states did not simply subsidize the fine arts but sought to monopolize them and the production of precious metals in particular.

by JOHN V. MURRA
Institute of Andean Research, 515 Dryden Rd., Ithaca, N.Y. 14850, U.S.A. 14 x 84

Of the many suggestive points made by D'Altroy and Earle, I will comment on only two:

1. Long-distance transport of staples is conventionally viewed as "heavy," hence difficult, hence unlikely. I would suggest that here we confront one of the many instances of Andean "exceptionalism": the visible presence of the road and *tampu* system. According to Hyslop's (1984) field studies, there were more than 25,000 kilometers of highway, much of it dating long before the Inka. The annual caravans, hauling staples as well as prestige goods, that linked the frequently distant outliers of a polity's holdings sprinkled over the Andean landscape are also likely to have been pre-Inka (Núñez and Dillehay 1979). These can be documented from contemporary ethnography (Flores Ochoa 1977). The presence of camelid as well as human bearers and its high-status destinations help explain why maize would travel the hundreds of miles from Cajamarca to Cusco or from Cochabamba to the warehouses of Paria and beyond. All this points to our need to reconsider the conventional wisdom on long-distance transport, now also being reexamined for the ancient world (Garnsey, Hopkins, and Whittaker 1983). Such reconsideration need not conflict with the stress on state storage which emerged from the Huánuco fieldwork and which the authors have elaborated.

2. D'Altroy and Earle are right to argue for "the importance of control of goods and their role in underwriting the state political economy." Their "focus . . . on the production, management, and disbursement of goods" is tactically sound at this time. Their stress may encourage the coordinated use beyond the Wanka territory of both archaeological and historical evidence. To cite one example: some 15 years ago, I was taken by our colleagues at the University of Cochabamba to an archaeological monument—some 2,400 almost identical storehouses built on a single mountainside. We wondered then about the productivity required to fill such storage capacity. Only years later, when Wachtel (1980) located some litigation records in the Cochabamba archives, did we learn of the gigantic state maize plantations nearby. The Cusco state had installed them in the last two decades before the European invasion. We became aware of a technological but also a social innovation: the new acreage was worked with highland *mit'a,* not *mitmaq,* labor. Two additional, unprecedented, state productive facilities have been located in the same Qollasuyu quarter. One reflects the importance of coca leaf—not only at the peasant level (Ortiz de Zúñiga 1967–72 [1562]) but also for state purposes. In the *yunga* of La Paz, we hear of entire lowland settlements devoted to the state production of the leaf (Murra 1972:case 5). The other concerns a textile factory employing "one thousand weavers," men, not *aqllakuna,* producing what may have been military cloth (Murra 1979). Located near Lake Titicaca, this protoindustrial installation is now the object of both archaeological and archival research by Geoffrey Spurling.

Beyond theoretical inquiries, Andean studies require also reconsiderations of our research strategies: many of the elementary facts about the Inka state, particularly the structural changes of the 1500–32 period (Murra 1980 [1956]: chap. 8), are still to be revealed.

by THOMAS P. MYERS
University of Nebraska State Museum, W436 Nebraska Hall, Lincoln, Nebr. 68588-0514, U.S.A. 16 x 84

D'Altroy and Earle set out to examine the reorganization of the economic system of the Inca state and development of new forms of finance. Logically, this requires definition of an earlier system, a later system, and the processes by which one was transformed into the other. This could be accomplished by a steady-state/change/steady-state model but would be more productive if the earlier economic system were considered open and subject to manipulation by its participants. Instead, the authors confine themselves to matching the components of the Inca economic system (staple finance, wealth finance) to a model for which they fail to find the crucial component (convertibility between the two kinds of finance). Rather than rejecting the model, they gloss over the absence of this essential component with qualifying words ("often," "generally"). Reference to the Hawaiian, Aztec, and northern Andean economic systems only serves to emphasize the lack of convertibility in the Inca system.

If staples cannot be converted into wealth and vice versa, it might be more productive to describe the Inca economic system as being composed of a series of goods, such as grain, cloth, silver, and ceramics, with different spheres of circulation. In this system, the possession of certain classes of goods is symbolic of a person's right to other classes of goods and services. For example, certain grains may be distributed throughout the populace whereas other grains and certain ceramics have a restricted distribution. The distribution of other ceramics and certain kinds of cloth may be even more restricted. Certain goods are acceptable as payment (i.e., valued as gifts) because they validate a person's position in the social system and because that position provides access to certain kinds of goods. (Thus, the right of travelers to some of the *cumbi* cloth given to the *caciques* of Chucuito might have been recognized by their possession of such symbols as a shirt of a particular pattern.) Goods of restricted distribution may be displayed as proof of a person's social position and may be so used in a Spanish court of law. The key feature of this system is that, while goods are not convertible into one another, the possession of one provides access to a range of others. This characterization seems to fit the facts presented by D'Altroy and Earle. One of the shortcomings of this system is that it is liable to manipulation through theft and displacement in time or space. A thief may move to a new province, or his heirs may display a stolen object as proof of traditional rights that have been forgotten through time.

Though the changing use of silver in the Mantaro Valley is interesting, the authors fail to provide us with a detailed examination of the change implied by the use of the words "development" and "reorganization" in their abstract. Indeed, the origins of the Inca economic system may go back at least to the Wari empire, which also had wealth goods and massive storage systems. The greater wealth in silver in the Mantaro Valley prior to the Inca takeover may have been possible only in the interregnum period. In a processual sense, it is one thing to establish a system and quite another to reestablish it.

The authors' distinction between wealth finance and staple finance highlights the contrast between the Inca economic system and the economic systems of the Aztec and Hawaiians. The latter are characterized by the convertibility of wealth goods into staple goods. The Inca system seems to be characterized by the ability of the bearer of a wealth good to make a draft upon the treasury of the state. The difference is

significant because while a wealth good can be sold only once, it can be used to make a draft upon the treasury many times.

by FRANK SALOMON
Department of Anthropology, 5240 Social Sciences, University of Wisconsin, Madison, Wis. 53706, U.S.A. 8 X 84

A new way to explain the momentum of empire is a prize worth going after, and D'Altroy and Earle score in explaining why wealth is regularly bound up with it. Their model, however, strikes me as more useful for explaining the way Tawantinsuyu or other empires behave after the posited shift to wealth finance occurs than for explaining how or why it occurs.

Two kinds of questions come to mind. The less important kind concerns evidential specifics D'Altroy and Earle draw from my Ecuadorian research. They contend that in the Pasto region, where Inca control was weak or absent, local lords financed rule by collecting bead-wealth *(chakira)* from their status-trader corps *(mindaláes)* and that in more Inca-dominated provinces the Inca state "usurped" a part of this flow. But in these latter cases the evidence that Incas tapped status-traders directly is not clear-cut (and I find no text in which I made it appear so). It is true that Quito Incas centralized and supervised status-trader operations. But since the traders remained subject to their non-Inca local lord, their contribution to Inca revenue should have appeared as an item in D'Altroy and Earle's list. In fact, the one sumptuary item listed—*qompi,* fine fabric—was Inca in name and mode of production, and all typical trader goods are absent (Salomon 1978*a*:242). Perhaps they suspect that Incas diverted trader goods outside normal tribute channels; but this would be a sharp anomaly, and there is no record of it.

The second and more fundamental kind of question concerns the alleged shift to wealth finance. D'Altroy and Earle argue that when wealth finance becomes a functional desideratum empires acquire it from societies that already practice it or develop it endogenously. But why did equatorial chiefdoms already possess it, lacking as they did the scale and internal complexity that allegedly make staple finance impractical? Why did both Amazonian (Oberem 1971:171–72) and maritime equatorial (Holm 1966–67) peoples possess better-developed currencies than any Andean empire? Why is it among the tiny Pasto polities, and not in any part of consolidated Tawantinsuyu, that we find a system of wealth-finance politics robust enough to survive into the Hispanic era and even convert local Spaniards to the use of bead-wealth currency (Tassaçion de los tributos 1571)?

There may be a separate set of functional considerations, different from those affecting empires, that favor "structuring economic relations . . . in terms of a flow of valuables" in areas lacking centralizing states, but parsimony urges a unified explanation. The considerations of efficiency, durability, and integration that D'Altroy and Earle raise look like a good start.

by KATHARINA J. SCHREIBER
Department of Anthropology, University of California, Santa Barbara, Calif. 93106, U.S.A. 18 X 84

D'Altroy and Earle have made a strong case for studying the political economy of complex societies in terms of staple finance and wealth finance. In the specific case they address, the Inka empire, they have shown this approach to be particularly instructive. The most important, albeit controversial, contribution of their article is the suggestion that the imposition of the labor tax was dependent on the quantity of goods required by the state. Traditional analyses of the political economy, which focus on the labor tax, have been based almost exclusively on ethnohistoric sources. When one is dealing with primarily archaeological data, the "financial" approach suggested by D'Altroy and Earle may be much more fruitful. Staple finance and wealth finance have direct physical correlates in the material culture recovered by the archaeologist, ranging from individual artifacts to complexes of state storehouses, while a phenomenon such as a labor tax is only very indirectly, if at all, visible in the archaeological record. A case in point might be the Wari empire, an Andean empire that preceded that of the Inkas by perhaps 600 years; no historic or ethnohistoric documents are available, so interpretations of Wari political economy must rely exclusively on archaeological data. Viewing the economy of this state in terms of staple and wealth finance may offer new interpretations of particular "exotic" artifacts and suggest that Wari, too, must have relied on a system of storage, although large-scale storage facilities have yet to be clearly identified.

Regarding the intraprovincial organization of staple finance in the Upper Mantaro Valley, D'Altroy and Earle point out that the locations of most storage centers are explained by their proximity to loci of political authority. However, some storage areas do not seem to be located relative to political centralization, nor are they distributed relative to local population centers. In the area with which I am most familiar, a small valley in southern Peru, three Inka storage centers are found, none of which is located with respect to either centralized political authority or local population distribution. Rather, one is associated with an Inka road; the other two are located adjacent to what is today the most productive agricultural tract in the region. Given that D'Altroy and Earle suggest that the presence of large storage centers is related to the high cost of transportation of staples, cost of transport might also account for the presence of storehouses in proximity to production zones. Might this not be the case in the Upper Mantaro Valley?

In sum, I find this a most intriguing approach to Inka political economy. Although it is likely to produce some initially negative reactions, I think that in the long run it will prove to be a most productive avenue of investigation, not only for the Inka case but for other prehistoric complex societies as well.

by JOHN R. TOPIC
Department of Anthropology, Trent University, Peterborough, Ont., Canada K9J 7B8. 2 X 84

This is an exceptionally ambitious article. The authors set out to examine the reorganization of economic systems under the Inca state. In meeting this goal they are only partially successful, since they fail to establish a baseline of pre-Incaic economic organization with which to compare the Inca system.

Over the last two decades it has become obvious that there were many regional differences throughout the Central Andes, and one would not expect to be able to establish a single model of pre-Incaic economic organization. Of a number of available examples, D'Altroy and Earle discuss two (Ecuador and Chincha) in which the Inca incorporated and possibly extended the range of variant regional systems. The treatment of pre-Inca economics in the Mantaro area is, however, too abbreviated.

Although D'Altroy and Earle note that the Mantaro area was logistically critical to the Inca empire, they neglect to mention that it contained a major junction connecting the parallel coastal and highland roads. This oversight is perhaps related to their insistence that staples are never shipped long distances and are related only to the intraprovincial system; they suggest that almost all the products stored in the immense complexes at Jauja (Xauxa) were produced within that province. There is the implication here of an exceptionally burdensome exploitation of the province by the Inca. The only storage facility of similar size that I know of is located in Cotapachi, Bolivia. Cotapachi is located quite near Cochabamba, the maize-

growing area cited as an exception to local consumption in their n. 3.

Instead of reflecting the disproportionate exploitation of the Mantaro Valley, the concentration of storage at Jauja, as at Cotapachi, might be interpreted as evidence that the Inca occasionally did ship staples long distances to certain crucial transportation nodes. While I agree in principle that the long-distance movement of staples is not cost-effective, or necessary, Spanish records are full of references to such movements of goods (Ortiz de Zúñiga 1967–72 [1562], vol. 1: 37, 47, 59, 64, 69, 74, 84, 87, 90, 94, 239; vol. 2: 32, 38, 44, 51–52, 61, 258; Diez de San Miguel 1964 [1567]:81, 92, 116). These documents specify that goods were moved from Chucuito, near the Bolivian border, to Cuzco or even Quito, Ecuador, and from the Huánuco area of north central Peru south to Cuzco, north to Quito, or "wherever the Inca commanded." At times the goods moved over these distances were elite objects, but dried fish, freeze-dried potatoes, chiles, coca, and "food" are also specified. In the long run, too, it might have made economic sense for the Inca to improve plant breeds by shipping large quantities of crops to be used as seed.

The Huánuco document shows that taxpayers had to travel four to seven days in order to deliver their products to even the nearest administrative centers. Thus the concentration of storage facilities around a limited number of administrative centers actually implies a massive expenditure in moving staples. It should also be noted that the concentration of storage in a few centers was not necessarily for security reasons, since storage complexes are never fortified.

The distinction between wealth and staple goods, which the authors admit is only heuristic, would have to be refined in terms of functional and status contexts. Local lords on the north coast, for example, were obligated to provide the food and tools of persons engaged in paying their labor tax (Netherly 1977:210–18); this obligation is analogous to the obligation of the Inca to reward the service of subject lords with privileges, cloth, and concubines. This continuity of the categories "staple" and "wealth" is well illustrated by D'Altroy and Earle's report of the ubiquity of copper and silver in Huanca II and III households. In many other contexts, and indeed by their definition, copper can be considered a wealth good. To understand the distribution of metals we would have to know if all households were of the same class, if the same occupational specializations were represented, what form the metal took, why silver would have been abandoned in Huanca II households, whether Huanca III households might have been compelled to hand over silver to the Spanish, and, at least, how many households were analyzed.

Despite these criticisms, I admire the quantity of research represented in the paper and congratulate the authors on the extensive review presented.

Reply

by TIMOTHY K. EARLE and TERENCE N. D'ALTROY
Los Angeles, Calif., and New York, N.Y., U.S.A. 25 XI 84

We must first thank the commentators for their thoughtful reading of our paper and for their useful remarks. All show a firm grasp of our intent and main arguments. Their comments, although sometimes critical, help significantly to focus attention on the central issues of state finance in complex Andean societies and on directions for further research.

Our paper investigates the nature of the political economy in a nonindustrial state and more specifically, as La Lone and Murra observe, the means by which a state could finance itself in a marketless society. As Murra emphasizes, this is done through control over production of staples and wealth (for example, in the Inka state, coca farms and semi-industrial textile factories). Browman appears to disagree, arguing for the importance of the market principle in long-distance exchange. Certainly the Chincha merchants to whom he refers existed in sizable numbers, but their role in the Inka state appears to have been primarily long-distance procurement of wealth from outside the empire's territory; this was a source of wealth that was probably controlled opportunistically by the state. Market behavior among Andean societies appears to have occurred primarily below the state economy in restricted areas, such as among the highland Ecuadorian peoples (Salomon 1978*b*), on the north coast of Peru, where communities specialized in the production of certain commodities for exchange (see above, Netherly 1978), and among various ethnic groups that produced specialty crops or products for exchange among neighbors in different environmental zones (e.g., along the eastern side of the Andean *cordillera* [see Burchard 1974]). While Andean economies under the Inkas thus exhibit some characteristics of market economics, we feel that extensive occurrence of market behavior in the Inka state remains to be demonstrated.

Several reviewers point out the methodological advantages to combining ethnohistoric and archaeological approaches in the study of the economic and political organization of the Inka empire. We hope to see this important integration, which Murra's publications (e.g., 1975; see also La Lone above) have repeatedly emphasized, developed more completely in future work. Schreiber extends the argument to stress the importance of material evidence, such as storage, for study of the organizational aspects of society. Our commentators are also to be thanked for the important new data on storage (Browman, Moseley), for references to relevant uncited source material (Murra, Topic), and for corrections of factual material (Salomon). Additionally, they repeatedly raise three substantive issues that extend the analysis we have attempted.

First is the issue of continuity and change in the nature of finance. Topic justly takes us to task for our failure "to establish a baseline of pre-Incaic economic organization with which to compare the Inca system." Similarly, Moseley and Myers emphasize that Inka statecraft was built on preexisting models from Chimor and Wari. At present, however, an ambitious comparison of Inka and pre-Inka state economics is not feasible because of the highly variable nature of pre-Inka society (cf. Topic) and the ambiguity of present archaeological evidence for the pre-Inka period. For example, Myers suggests that "the origins of the Inca economic system may go back at least to the Wari empire, which also had wealth goods and massive storage systems." Schreiber, who has conducted extensive research in the heartland of the Wari state, believes this may be the case but suggests that the available evidence is inconclusive: "Wari, too, must have relied on a system of storage, although large-scale storage facilities have yet to be clearly identified."

Browman, who conducted his doctoral research in the Mantaro Valley, offers extensive commentary, both theoretical and empirical. We greatly appreciate the attention that he has given our paper but find that there are a number of issues on which we disagree. While this is not an appropriate forum for examining the details of the archaeology of the Mantaro Valley, we would like to address some of his principal criticisms. He contends that a major reason for extensive storage in the Mantaro is the presence of pre-Inka storage complexes there. As we have argued elsewhere (Earle and D'Altroy 1982), there is no evidence for massive, discrete pre-Inka storage facilities in the area we studied. All of the storage complexes preserved follow architectural canons common to Inka state storage complexes elsewhere in the empire. At the rare sites that have extensive associated ceramic refuse, both local Wanka III and Inka ceramics are almost invariably found. The most persuasive point against Browman's position, however, is that Wanka II was characterized by intense intravalley warfare. Settlements were heavily fortified both by their hilltop loca-

tions and by surrounding fortress walls. It would have been strategically unsound to place the storage basic to political finance and security undefended outside the walls. Now, it is certainly possible that the storage in the southern part of the valley, where Browman concentrated his work, did not follow this pattern. But why? He suggests that there were ethnic divisions in the valley with different cultural traits, one of which was storage. We do not find this answer satisfactory.

Browman further argues that one of the reasons we have failed to recognize the existence of discrete pre-Inka storage facilities is that we have not taken into account the presence and role of Wanka residential and managerial settlements associated with the storage sites. While we did not discuss the spatial and functional relationships of these sites in the present paper, we have done so in at least four other works (Earle et al. 1980, D'Altroy 1981, Earle and D'Altroy 1982, D'Altroy and Hastorf 1984), one of which Browman cites here (D'Altroy 1981). In brief, our point is that the consistent spatial separation (often by 100–200 m) of the Wanka III residential areas from storage facilities reflects a conceptual and actual separation of Wanka- and Inka-controlled facilities. In a related vein, Browman usefully observes that the three provincial subdivisions *(saya)* had pre-Inka antecedents, a point we did not express clearly in our paper but agree with. In fact, we have expressly made this point elsewhere (D'Altroy 1981) but do not agree that this implies that the storage facilities were pre-Inkaic.

We also disagree with Browman's assertion that we consider the *qollqa* to be Inka because our work has been focused on the Yanamarca Valley, where there are few *qollqa*. He is correct that our principal surface and excavation work on Wanka communities has been conducted within the Yanamarca Valley (which lies immediately adjacent to the main Mantaro Valley). However, our research on storage and other Inka settlements was necessarily conducted in the main Mantaro Valley, because that is where the sites are located. In addition, our project has conducted extensive agricultural surveys in the main valley (Hastorf 1983), and we have had full access to the Junin Project's settlement survey results, which covered the northern half of the valley, that is, the area to which our storage data refer.

Browman is correct in saying that the distribution of Inka storage in the Upper Mantaro Valley cannot be explained simply by proximity to the Inka capital, Hatun Xauxa. However, we do not assert this. We argue that, statistically, about 79% of the spatial distribution of state storage in the *northern half* of the valley can be explained by proximity to the capital. We cannot explain the spatial distribution of the state storage in the southern half of the valley (i.e., 25 km or more south of Hatun Xauxa) because we still do not know the specific capacities of each facility. We appreciate the information that Browman has provided, but, unfortunately, the site-specific data refer only to sites for which we already have concrete estimates of capacity. No site-specific information is provided for the more southerly sites, in the area outside our survey limits. Documentary evidence referring to the presence of a major Inka storage complex in the southern part of the valley is also welcome, but again no specific reference is provided and we cannot evaluate information to which we do not have access. A concentration of Inka storage in the southern part of the valley would not be surprising. If our assumptions about costs of transportation and concentration of state-funded activity at state centers are warranted, we would expect a rise in state storage towards the south of the valley, near a smaller Inka center in that area.

The adoption of wealth finance from pre-Inka state societies is well described by Moseley for the Chimor state. He argues that the centralized manufacture and storage of wealth were extremely important at the capital Chan Chan (see Day 1982, Topic 1982) and that the Inkas coopted this preexisting system by moving the north-coast smiths to Cuzco. Although the archaeological evidence is not conclusive, Moseley's argument is compelling and is of course congruent with our own. Both Chimor and Wari were expansionist imperial states facing problems similar to those of the Inkas; we fully expect similarities between their financial bases because of analogous conditions and direct historical continuities.

This leads us to the second general issue, the role of wealth in the Inka empire. Browman implies that cloth as we define it would not be considered wealth because of its comparatively low value-to-weight ratio. We disagree. Fine cloth, such as *kumpi,* was certainly highly valued (Murra 1962, Earle n.d.). Cloth is often an item of wealth in preindustrial societies such as those of the Northwest Coast or Africa. Certainly cloth, because of its skilled-labor investment, its visibility as a status marker in display, and its storability, was an excellent early wealth object.

Topic asks several pertinent questions about the metal wealth. Since writing this paper, we have significantly expanded our sample size with a second field season. To answer Topic very briefly, 29 prehistoric patio groups (each thought to represent a household) have been excavated. These are approximately evenly distributed by time period and status (Wanka II: 5 elite, 9 commoner; Wanka III: 6 elite, 8 commoner). All shared certain basic householding activities, although elite households were somewhat more involved in craft production (spinning, ceramic manufacture, and metalworking) than those of commoners. Wanka II metals were primarily ornamental (discs, pins, pendants); these forms continued into Wanka III but with an important increase in utilitarian objects (especially needles, chisels, axes, weights). The shift in silver from Wanka II to III was in absolute frequency of occurrence and not relative frequency in the assemblage. In Wanka IV, the early colonial period, silver frequency continued to decline, probably reflecting the Spanish control of labor production and distribution in the region, associated with a marked population drop.

With respect to the function of wealth, Myers raises the critical issue of convertibility. As wealth becomes the central means of finance, it must be convertible into subsistence goods needed by families not involved in food production. For the Aztecs, Brumfiel (1980), for example, has argued that wealth was convertible into subsistence goods in the marketplace. In the Inka empire (and in Hawaiian chiefdoms [*contra* Myers]), many classes of wealth appear largely to have existed in a separate sphere of exchange not *directly* exchangeable for subsistence goods. Myers therefore asks (and answers very well) how wealth can serve as the basis of finance. Perhaps we were not clear on this point, but in the Inka empire wealth was not the basis of finance but an important subsidiary form. The primary basis of finance was clearly the control of staple production and storage. Wealth, rather, was used to centralize the political system. The wealth was primarily important because of its symbolic use to define and legitimize status distinctions. It validated status positions associated with explicit rights to staple goods from the staple-finance system. The central control of many forms of wealth, as "political currency," translated not into direct access to subsistence goods in the market but into indirect access through control over land and labor.

As a number of commentators note (e.g., Browman, Myers), our *heuristic* division of the means of finance into staple and wealth implies that a gradient existed between goods whose principal uses were purely subsistence (e.g., potatoes, quinoa) or symbolic (e.g., gold, silver). We drew the dichotomy as a means to emphasize the distinctions in the state's use of various materials. Those goods that, among certain ethnic groups, fell between the ends of the continuum are particularly intriguing because they offer insight into the means by which Andean

societies and, to a certain extent, the Inka state integrated the two. We have already noted the widespread convertibility of coca (sometimes locally grown as a specialty crop) into various other commodities (Burchard 1974, Rostworowski 1978). The Inka state's adoption of these convertible goods in the regionally variable economies in which they were already in use is a central point in our argument (*contra* Browman).

Also questioning our evolutionary interpretation of wealth, Salomon asks why wealth finance should have existed (in forms more elaborate than among the Inka) in chiefdoms to the north. Wealth finance certainly existed in non-state societies such as Salomon describes and even simpler societies such as those of the Trobriand Islands and New Guinea (Burton 1975, Earle 1982). Our argument again concerns the use of wealth in expanding imperial states in which staple finance, although primary, presents problems of centralized control. Where wealth exists as the primary form of political finance, the political organization is unstable. Antonio Gilman (personal communication), for example, compares two kinds of Iberian chiefdom during the Bronze Age. Chiefdoms in the southeastern part of modern Spain, based on irrigation and staple finance, were remarkably stable, while the wealth-based chiefdoms of Portugal maintained broader economic ties but were short-lived. To overcome the spatial and transportational limits of a staple-finance system, wealth finance might reasonably be expected to have been adopted from societies conquered by the expanding state. To provide subsistence for state-supported personnel, the staple-finance aspect of the state economy would have been introduced where it did not exist. It is the interplay between the two that provides the technologically limited state the capability of supporting activities throughout a wide region.

The third issue brought up by commentators is movement of staple goods through the Inka empire. As La Lone puts it, "we ask how and why staple goods are moved, especially when they are low in exchange value and high in bulk." Murra sees the empire as exceptional, with considerable movement of staple goods, in addition to wealth, over distances by llama caravan and human bearer. We do not dispute that staple goods were sometimes moved long distances, and Topic lists some historic sources that document this movement. This still does not refute the argument that it was costly to move staples long distances and that such movement was probably quite limited. Interestingly, Schreiber suggests that some storage was *not* centralized in order to minimize transport cost. Certainly, this is true; about 50% of the Mantaro Valley storage was away from the main provincial administrative center and close to agricultural fields (see Browman; Earle and D'Altroy 1982). Considerable cost was incurred, however, even in moving the staples into the nearest administrative center, probably to exercise more control (see Topic). Why move the goods further? Here it would seem that support of military operations was the primary justification (see, for example, Wachtel 1982). The position of Hatun Xauxa's massive storage, centrally located at a major junction of the imperial road network (see Topic), suggests its strategic importance. The movement represents a weakness in the staple-finance system, however, in that needed goods were not locally available for strategic support but had to be moved regardless of cost.

Much is left to do to understand the economic workings of the Inka empire, but we are pleased to see a consensus among researchers represented here and a definition of key areas for future research.

References Cited

ACOSTA, JOSEPH DE. 1894 (1590). *Historia natural y moral de las Indias*. Madrid.

ADAMS, RICHARD. 1978. Man, energy, and anthropology. *American Anthropologist* 80:297–309.

ANDERS, MARTHA B. 1981. Sistema de depósitos en Pampa Grande, Lambayeque. *Revista del Museo Nacional* (Lima) 43:243–79.

BAUDIN, LOUIS. 1928. *L'empire socialiste des Inka*. Paris.

BAWDEN, GARTH. 1982. "Galindo: A study in cultural transition during the Middle Horizon," in *Chan Chan: Andean desert city*. Edited by Michael E. Moseley and Kent C. Day, pp. 285–320. Albuquerque: University of New Mexico Press.

BERDAN, FRANCES. 1975. *Trade, tribute, and market in the Aztec empire*. Ann Arbor: University Microfilms.

BETANZOS, JUAN DE. 1880. "Suma y narración de los Incas," in *Biblioteca hispana ultramarina*. Edited by Jimenez de la Espada. Madrid.

BOHANNAN, PAUL. 1955. Some principles of exchange and investment among the Tiv. *American Anthropologist* 57:60–70.

BRADFIELD, MAITLAND. 1971. *The changing pattern of Hopi agriculture*. London: Royal Anthropological Institute.

BROWMAN, DAVID L. 1970. Early Peruvian peasants: The culture history of a central highlands valley. Ph.D. diss., Harvard University, Cambridge, Mass.

———. 1977. The altiplano mode of economic integration and prehispanic Tiwanaku. Paper presented at the 76th annual meeting of the American Anthropological Association, Houston, Tex. [DLB]

———. 1984. "Development of interzonal trade and economic expansion in the altiplano," in *Social and economic organization in the prehispanic Andes*. Edited by D. L. Browman, R. L. Burger, and M. A. Rivera, pp. 117–42. British Archaeological Reports International 194. [DLB]

———. n.d. "Some political and economic implications of the Wari-Ṭiwanaku interface," in *Origin of the prehistoric Andean state*. Edited by W. Isbell. In preparation. [DLB]

BRUMFIEL, ELIZABETH. 1976. *Specialization and exchange at the Late Postclassic (Aztec) community of Huexotla, Mexico*. Ann Arbor: University Microfilms.

———. 1980. Specialization, market exchange, and the Aztec state: A view from Huexotla. CURRENT ANTHROPOLOGY 21:459–78.

———. 1983. Elite and utilitarian crafts in the Aztec empire. Paper delivered at the XIth International Congress of Anthropological and Ethnological Sciences, Vancouver, August.

BRUSH, S. B. 1976. Man's use of an Andean ecosystem. *Human Ecology* 4:147–66.

BURCHARD, RODERICK. 1974. "Coca y trueque de alimentos," in *Reciprocidad e intercambio en los Andes peruanos*. Compiled by Giorgio Alberti and Enrique Mayer, pp. 209–51. Lima: Instituto de Estudios Peruanos.

BURTON, R. 1975. Why do the Trobriands have chiefs? *Man* 10:544–58.

CARRASCO, PEDRO. 1978. "La economía del México prehispánico," in *Economía política e ideología en el México prehispánico*. Edited by P. Carrasco and J. Broda, pp. 15–76. Mexico: Nueva Imagen. [DL]

———. 1980. Comment on: Specialization, market exchange, and the Aztec state: A view from Huexotla, by E. M. Brumfiel. CURRENT ANTHROPOLOGY 21:468. [DL]

CASTRO, CRISTÓBAL DE, and DIEGO DE ORTEGA MOREJÓN. 1936 (1558). "Relación y declaración del modo que este valle de Chincha . . .," in *Quellen zur Kulturgeschichte des präkolumbischen Amerika*. Edited by Hermann Trimborn, pp. 236–46. Stuttgart.

CERRÓN PALOMINO, R. 1976. *Gramática Quechua: Junin-Huanca*. Lima: Ministério de Educación. [DLB]

CHAPMAN, ANNE. 1957. "Port of trade enclaves in Aztec and Maya civilizations," in *Trade and market in the early empires*. Edited by Karl Polanyi, Conrad M. Arensberg, and Harry W. Pearson, pp. 114–53. Chicago: Free Press.

CHILDE, V. GORDON. 1951. *Man makes himself*. London: Watts.

CIEZA DE LEÓN, PEDRO DE. 1862 (1551). "La cronica del Perú," in *Biblioteca de autores españoles* 26 vol. 1, pp. 349–458. Madrid: Ediciones Atlas.

———. 1967 (1553). *El señorío de los Incas*. Lima: Instituto de Estudios Peruanos.

CLAESSEN, HENRI J. M. 1978. "The early state: A structural approach," in *The early state*. Edited by H. J. M. Claessen and P. Skalník, pp. 533–96. The Hague: Mouton. [DL]

———. 1984. The internal dynamics of the early state. CURRENT ANTHROPOLOGY 25:365–80. [DL]

COBO, BERNABÉ. 1956 (1653). *Historia del nuevo mundo*. Vols. 2, 3. (Biblioteca de autores españoles 92.) Madrid: Ediciones Atlas.

DALTON, GEORGE. 1961. Economic theory and primitive society. *American Anthropologist* 63:1–25.

———. 1967. *Tribal and peasant economies*. Garden City: Natural History Press.

———. 1977. "Aboriginal economies in stateless societies," in *Exchange systems in prehistory*. Edited by Timothy Earle and Jonathan Ericson, pp. 191–212. New York: Academic Press.

D'ALTROY, TERENCE N. 1981. *Empire growth and consolidation: The Xauxa region of Peru under the Incas*. Ann Arbor: University Microfilms.

D'ALTROY, TERENCE N. and CHRISTINE A. HASTORF. 1984. The distribution and contents of Inca state storehouses in the Xauxa region of Peru. *American Antiquity*. In press.

DAY, KENT C. 1982. "Storage and labor service: A production and management design for the Andean area," in *Chan Chan: Andean desert city*. Edited by Michael E. Moseley and Kent C. Day, pp. 333–49. Albuquerque: University of New Mexico Press.

DIEZ DE SAN MIGUEL, GARCI. 1964 (1567). *Visita hecha a la provincia de Chucuito por Garci Diez de San Miguel en el año 1567: Versión paleográfica de Waldemar Espinoza Soriano*. Lima: Casa de la Cultura del Perú.

EARLE, TIMOTHY K. 1974. Evolution of Peruvian trade. Paper delivered at annual meeting of the society for American Archaeology, Washington, D.C.

———. 1977. "A reappraisal of redistribution: Complex Hawaiian chiefdoms," in *Exchange systems in prehistory*. Edited by Timothy K. Earle and Jonathan E. Ericson, pp. 213–29. New York: Academic Press.

———. 1978. *Economic and social organization of a complex chiefdom: The Halelea district, Kaua'i, Hawaii*. University of Michigan Museum of Anthropology Anthropological Papers 63.

———. 1982. "The ecology and politics of primitive valuables," in *Cultural ecology: Eclectic perspectives*. Edited by John Kennedy and Robert Edgerton. Washington, D.C.: American Anthropological Association.

———. n.d. "Specialization and the production of wealth: Hawaiian chiefdoms and the Inka state," in *Production, exchange, and complex societies*. Edited by E. Brumfiel and T. Earle. Cambridge: Cambridge University Press. In preparation.

EARLE, TIMOTHY K., and TERENCE N. D'ALTROY. 1982. "Storage facilities and state finance in the Upper Mantaro Valley, Peru," in *Contexts for prehistoric exchange*. Edited by Jonathan E. Ericson and Timothy K. Earle, pp. 265–90. New York: Academic Press.

EARLE, TIMOTHY K., TERENCE N. D'ALTROY, CATHERINE J. LEBLANC, CHRISTINE A. HASTORF, and TERRY Y. LEVINE. 1980. Changing settlement patterns in the Upper Mantaro Valley, Peru. *Journal of New World Archaeology* 4(1):1–49.

ESPINOZA DE SORIANO, WALDEMAR. 1963. La guaranga y la reducción de Huancayo. *Revista del Museo Nacional* (Lima) 32:8–80.

———. 1971 (1558–61). *Los Huancas, aliados de la Conquista*. Anales Científicos de la Universidad del Centro del Perú 1. Huancayo.

———. 1973. Las colonias de mitmas multiples en Abancay, siglos XV y XVI. *Revista del Museo Nacional* (Lima) 39:225–99.

———. 1975. Los mitmas huayacuntu en Quito o guarniciones para la represión armada, siglos XV y XVI. *Revista del Museo Nacional* (Lima) 41:351–94.

———. Editor. 1978. *Los modos de producción en el imperio inca*. Lima: El Mantaro.

ESTETE, MIGUEL DE. 1917 (1532–33). "La relación que hizo el señor capitan Hernando Pizarro . . . ," in *Verdadera relación de la conquista del Peru . . . ,* by Francisco de Xerez. Edited by Horacio Urteaga, pp. 77–102. Lima: Sanmartí.

FLORES OCHOA, JORGE. 1977. *Pastores de puna: Uywamichiq punarunakuna*. Lima: Instituto de Estudios Peruanos. [JVM]

FORDE, C. DARRYL. 1931. Hopi agriculture and land ownership. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 61:357–405.

FRIED, MORTON. 1967. *The evolution of political society*. New York: Random House.

FRIEDMAN, J., and M. J. ROWLANDS. 1977. "Notes towards an epigenetic model of the evolution of 'civilisation,' " in *The evolution of social systems*. Edited by M. J. Rowlands and J. Friedman, pp. 201–76. London: Duckworth.

GARCILASO DE LA VEGA (EL INCA). 1943 (1609). *Comentarios reales de los Incas*. Edited by Angel Rosenblatt. Buenos Aires: Emece Editores.

GARNSEY, PETER, KEITH HOPKINS, and C. R. WHITTAKER. 1983. *Trade in the ancient economy: Essays in honor of Sir Moses Finley*. London: Chatto and Windus. [JVM]

GODELIER, MAURICE. 1977. "The concept of 'social and economic formation': The Inca example," in *Perspectives in Marxist anthropology*, pp. 63–69. Cambridge: Cambridge University Press.

GOLDMAN, IRVING. 1970. *Ancient Polynesian society*. Chicago: University of Chicago Press.

GUAMAN POMA DE AYALA, FELIPE. 1956 (1615). *La primera nueva corónica y bueno gobierno*. Lima: Gráfica Industrial. [DLB]

HANDY, E. S. CRAIGHILL. 1923. *The native cultures in the Marquesas*. Bishop Museum Bulletin 9.

HARRIS, MARVIN. 1979. *Cultural materialism: The struggle for a science of culture*. New York: Random House.

HARTMANN, ROSWITH. 1971. Mercados y ferias prehispánicos en el area andina. *Boletín de la Academia Nacional de Historia* 54(188):214–35.

HASSIG, ROSS. 1981. The famine of One Rabbit: Ecological causes and social consequences of a pre-Columbian calamity. *Journal of Archaeological Research* 37:172–82.

HASTORF, CHRISTINE A. 1983. Prehistoric agricultural intensification and political development in the Jauja region of Peru. Ph.D. diss., University of California, Los Angeles, Calif.

HOLM, OLAF. 1966–67. Money axes from Ecuador. *Folk* 8/9:135–43. [FS]

HOUGH, WALTER. 1915. *The Hopi Indians*. Cedar Rapids, Iowa: Torch Press.

HYSLOP, JOHN. 1984. *The Inka road system*. New York: Academic Press. [JVM]

LA LONE, D. E. 1978. Historical contexts of trade and markets in the Peruvian Andes. Ph.D. diss., University of Michigan, Ann Arbor, Mich.

———. 1982. "The Inca as a nonmarket economy: Supply on command versus supply and demand," in *Contexts for prehistoric exchange*. Edited by Jonathan E. Ericson and Timothy K. Earle, pp. 291–316. New York: Academic Press.

LAVALLÉE, DANIELLE, and MICHELE JULIEN. 1973. *Les établissements asto a l'époque préhispanique*. Travaux de l'Institut Français d'Etudes Andines 15.

LEBLANC, CATHERINE J. 1981. *Late prehispanic Huanca settlement patterns in the Yanamarca Valley, Peru*. Ann Arbor: University Microfilms.

LUMBRERAS, LUIS G. 1974. *The peoples and cultures of ancient Peru*. Translated by Betty Meggers. Washington, D.C.: Smithsonian Institution Press.

MALINOWSKI, BRONISLAW. 1965. *Coral gardens and their magic*. Bloomington: Indiana University Press.

MALO, DAVID. 1971 (1898). 2d edition. *Hawaiian antiquities*. Bernice P. Bishop Museum Special Publications 2.

MARCOS, JORGE G. 1978. Cruising to Acapulco and back with the thorny oyster set: A model for a linear exchange system. *Journal of the Steward Anthropological Society* 9:99–132.

MÉTRAUX, ALFRED. 1969. *The history of the Incas*. Translated by George Ordish. New York: Schocken.

MITCHELL, WILLIAM. 1980. "Local ecology and the state: Implications of contemporary Quechua land use for the Inca sequence of agricultural work," in *Beyond the myths of culture*. Edited by Eric B. Ross, pp. 139–54. New York: Academic Press.

MOORE, SALLY FALK. 1958. *Power and property in Inca Peru*. Westport, Conn.: Greenwood Press.

MORRIS, CRAIG. 1967. *Storage in Tawantinsuyu*. Ann Arbor: University Microfilms.

———. 1972. "State settlements in Tawantinsuyu: A strategy of compulsory urbanism," in *Contemporary archaeology*. Edited by Mark P. Leone, pp. 393–401. Carbondale and Evanston: Southern Illinois University Press.

———. 1974. "Reconstructing patterns of nonagricultural production in the Inca economy: Archaeology and documents in instituted analysis," in *Reconstructing complex societies*. Edited by Carol Moore, pp. 49–68. Supplement to the Bulletin of the American Schools of Oriental Research 20.

———. 1981. "Tecnología y organización inca del almacenamiento de víveres en la sierra," in *La tecnología en el mundo andino*. Edited by Heather Lechtman and Anna Maria Soldi, pp. 327–57. Mexico City: UNAM.

MURRA, JOHN V. 1962. The function of cloth in the Inca state. *American Anthropologist* 64:710–728.

———. 1972. "El 'control vertical' de un máximo de pisos ecológicos en la economía de las sociedades andinas," in *Visita de la provincia de León de Huánuco en 1562,* vol. 2. Edited by John V. Murra, pp. 427–76. Huánuco, Peru: Universidad Nacional Hermilio Valdizán.

———. 1975. *Formaciones económicas y políticas del mundo andino*. Lima: Instituto de Estudios Andinos.

———. 1979. "Los olleros del Inka: Hacia una historia y arqueología del Qollasuyu," in *Historia, problema y promesa: Homenaje a Jorge Basadre*. Lima: Universidad Católica. [JVM]

———. 1980 (1956). *The economic organization of the Inka state*. Greenwich, Conn.: JAI Press.

———. 1982. "The *mit'a* obligations of ethnic groups to the Inka state," in *The Inca and Aztec states 1400–1800: Anthropology and*

history. Edited by George A. Collier, Renato I. Rosaldo, and John D. Wirth, pp. 237–62. New York: Academic Press.
NETHERLY, PATRICIA. 1978. *Local-level lords on the north coast of Peru*. Ann Arbor: University Microfilms.
NÚÑEZ ATENCIO, LAUTARO, and TOM D. DILLEHAY. 1979. *Movilidad giratoria, armonia social y desarrollo en los Andes Meridionales: Patrones de tráfico e interacción económica*. Antofagasta: Universidad del Norte. [JVM]
NYANTENY, V. K. 1972. *Storage of foodstuffs in Ghana*. Institute of Statistical, Social, and Economic Research (Legon) Technical Publications Series 18.
OBEREM, UDO. 1971. *Los Quijos: Historia de la transculturación de un grupo indígena en el oriente ecuatoriano, 1538–1956*. Madrid: Facultad de Filosofía y Letras, Universidad de Madrid. [FS]
ORTIZ DE ZÚÑIGA, IÑIGO. 1967–72 (1562). *Visita de la provincia de León de Huánuco en 1562*. 2 vols. Edited by John V. Murra. Huánuco, Peru: Universidad Nacional Hermilio Valdizán.
PARSONS, JEFFREY R. 1980. Comment on: Specialization, market exchange, and the Aztec state: A view from Huexotla, by E. M. Brumfiel. CURRENT ANTHROPOLOGY 21:471. [DL]
PARSONS, JEFFREY R., and CHARLES M. HASTINGS. 1977. Prehispanic settlement patterns in the Upper Mantaro, Peru: A progress report for the 1976 field season. Submitted to the Instituto Nacional de Cultura, Lima, Peru, and the National Science Foundation, Washington, D.C.
PAULSEN, ALISON. 1974. The thorny oyster and the voice of God, *American Antiquity* 74:597–607.
POLANYI, KARL. 1957. "The economy as instituted process," in *Trade and market in the early empires*. Edited by Karl Polanyi, Conrad Arensberg, and Harry Pearson, pp. 243–70. New York: Free Press.
———. 1968. *Primitive, archaic, and modern economies: Essays of Karl Polanyi*. Edited by George Dalton. Garden City: Doubleday.
POLO DE ONDEGARDO, JUAN. 1916 (1567). "Instrucción contra las ceremonias y ritos . . . ," in *Colección de libros y documentos referentes a la Historia del Perú*, series 1, vol. 3. Lima.
———. 1917 (1571). *Relación de los fundamentos acerca del notable daño que resulta de no guardar a los Indios sus fueros*. Edited by Horacio Urteaga. Lima: Sanmartí.
———. 1940 (1561). Informe . . . al licenciado Breviesca de Munatones sobre la perpetuidad de las encomiendas del Perú. *Revista Histórica* (Lima) 13:125–96.
PRICE, BARBARA J. 1978. "Secondary state formation: An explanatory model," in *Origins of the state: The anthropology of political evolution*. Edited by Ronald Cohen and Elman R. Service, pp. 161–86. Philadelphia: Institute for the Study of Human Issues.
———. 1982. Cultural materialism: A theoretical view. *American Antiquity* 47:709–41.
REED, NELSON. 1964. *The Caste War of Yucatan*. Stanford: Stanford University Press.
RENFREW, COLIN. 1972. *The emergence of civilization: The Cyclades and the Aegean in the third millennium B.C*. London: Methuen.
ROSTWOROWSKI DE DIEZ CANSECO, MARIA. 1970. Mercaderes del valle de Chincha en la epoca prehispánica: Un documento y unos comentarios. *Revista Española de Antropología Americana* 5.
———. 1977. *Etnía y sociedad: Costa peruana prehispánica*. Lima: Instituto de Estudios Peruanos.
———. 1978. *Señoríos indígenos de Lima y Canta*. Lima: Instituto de Estudios Peruanos.
———. 1981. *Recursos naturales, renovables, y pesca, siglos XVI y XVII*. Lima: Instituto de Estudios Peruanos.
ROWE, JOHN H. 1946. "Inca culture at the time of the Spanish conquest," in *Handbook of South American Indians*, vol. 2. Bureau of American Ethnology Bulletin 143. Edited by Julian R. Steward, pp. 183–330.
———. 1948. The kingdom of Chimor. *Acta Americana* 6:26–59.
SAHLINS, MARSHALL. 1958. *Social stratification in Polynesia*. (Monograph of the American Ethnological Society.) Seattle: University of Washington Press.
SALOMON, FRANK L. 1978*a*. *Ethnic lords of Quito in the age of the Incas*. Ann Arbor: University Microfilms.
———. 1978*b*. *Pochteca* and *mindalá:* A comparison of long-distance traders in Ecuador and Mesoamerica. *Journal of the Steward Anthropological Society* 9:231–46.
———. 1983. The north-Andean *mindalá* complex under Inca rule. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pa.
SANCHO, PEDRO. 1968 (1534). "Relación de lo sucedido ena conquista y pacificación de estas provincias de la Nueva Castilla . . . ," in *Obras de D. J. Garcia Icazbalceta,* vol. 8, pp. 299–423. Biblioteca de Autores Mexicanos 18.
SANTILLÁN, HERNANDO DE. 1968 (1563–64). "Relación del origen, descendencia política y gobierno de los incas . . . ," in *Biblioteca de autores españoles,* vol. 209, pp. 97–149. Madrid: Ediciones Atlas.
SCHAEDEL, RICHARD P. 1978. "Early state of the Incas," in *The early state*. Edited by Henri J. M. Claessen and Peter Skalník, pp. 289–320. The Hague: Mouton.
SCHNEIDER, HAROLD. 1976. *Economic man*. New York: Free Press.
SCUDDER, THAYER. 1962. *The ecology of the Gwembe Tonga*. Manchester: Manchester University Press.
SERVICE, ELMAN R. 1975. *Origins of the state and civilization: The process of cultural evolution*. New York: Norton.
SMELSER, NEIL. 1959. A comparative view of exchange systems. *Economic Development* 7:173–82.
SMITH, C. T. 1970. The depopulation of the central Andes in the 16th century. CURRENT ANTHROPOLOGY 11:453–64.
STEVENSON, MATILDA. 1905. The Zuni Indians: Their mythology, esoteric fraternities, and ceremonies. *Twenty-third Annual Report, Bureau of American Ethnology, 1901–1902*. Washington, D.C.
STEWARD, JULIAN. 1960. *Theory of culture change*. Urbana: University of Illinois Press.
STRONG, WILLIAM DUNCAN, and CLIFFORD EVANS, JR. 1952. *Cultural stratigraphy in the Viru Valley, Peru*. New York: Columbia University Press.
Tassaçion de los tributos de los naturales de las ciudades de San Joan de Pasto y Almaguer . . . Año de MDLXX y MDLXXI . . . . 1571. Archivo General de Indias, Sevilla, Aud. Quito 60:2. [FS]
THURNWALD, RICHARD. 1932. *Economics in primitive communities*. Oxford: Oxford University Press.
TOLEDO, FRANCISCO DE. 1940 (1570). "Información hecha por orden de don Francisco de Toledo en su visita de las provincias del Perú . . . ," in *Don Francisco de Toledo, supremo organizador del Perú, su vida, su obra [1515–1582]*. Edited by Roberto Levillier, vol. 2, pp. 14–37. Buenos Aires: Espasa-Calpe.
———. 1940 [1571]. "Información comenzada en el Valle de Yucay el 2 de junio . . . ," in *Don Francisco de Toledo, supremo organizador del Perú, su vida, su obra [1515–1582]*. Edited by Roberto Levillier, vol. 2, pp. 122–77. Buenos Aires: Espasa-Calpe.
TOPIC, JOHN. 1982. "Lower-class social and economic organization at Chan Chan," in *Chan Chan: Andean desert city*. Edited by Michael E. Moseley and Kent C. Day, pp. 145–75. Albuquerque: University of New Mexico Press.
VEGA, ANDRÉS DE. 1965 (1582). "La descripción que se hizo en la provincia de Xauxa por la instrucción de su Majestad que a la dicha provincia se invio de molde," in *Biblioteca de autores españoles,* vol. 183, pp. 166–75. Madrid: Ediciones Atlas.
WACHTEL, NATHAN. 1977. *The vision of the vanquished*. Translated by Ben and Sian Reynolds. Hassocks, Sussex: Harvester Press.
———. 1980. Les *mítimas* de la vallée de Cochabamba: La politique de colonisation de Huayna Capac. *Journal de la Société des Américanistes* 66:297–324. [JVM]
———. 1982. "The *mítimas* of the Cochabamba Valley: The colonization policy of Huayna Capac," in *The Inca and Aztec states 1400–1800: Anthropology and history*. Edited by George A. Collier, Renato I. Rosaldo, and John D. Wirth, pp. 199–235. New York: Academic Press.
WERGE, ROBERT W. 1977. *Potato storage systems in the Mantaro Valley region of Peru*. Lima: International Potato Center, Socioeconomic Unit.
WHITE, LESLIE. 1959. *The evolution of culture*. New York: McGraw-Hill.
WRIGHT, HENRY T. 1977. "Toward an explanation of the origin of the state," in *Explanation of prehistoric exchange*. Edited by James N. Hill, pp. 215–30. Albuquerque: University of New Mexico Press.
WRIGHT, HENRY T., and GREGORY JOHNSON. 1975. Population, exchange, and early state formation in southwestern Iran. *American Anthropologist* 77:267–89.
ZUIDEMA, R. TOM. 1964. *The ceque system of Cuzco*. Leiden: Brill.